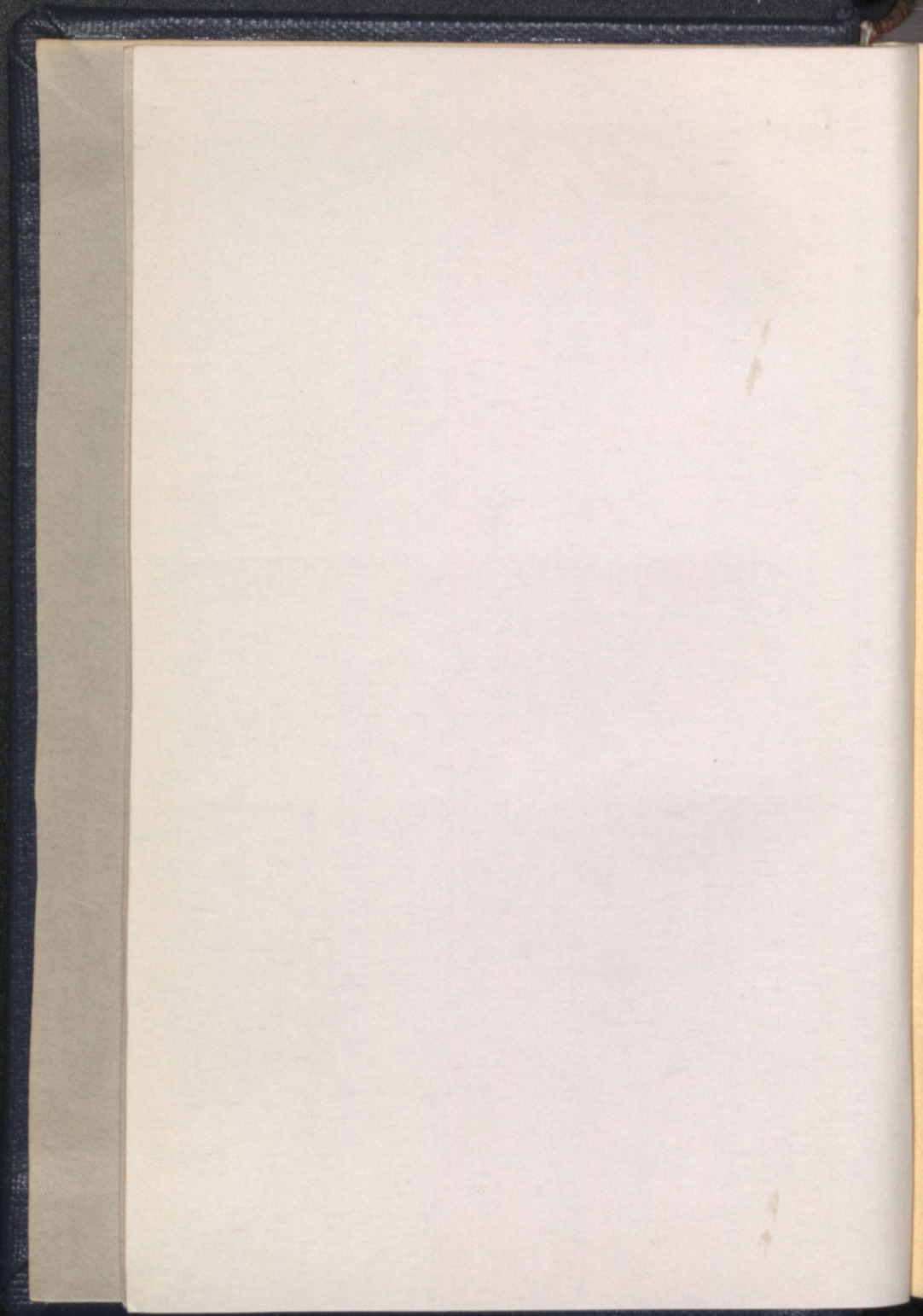


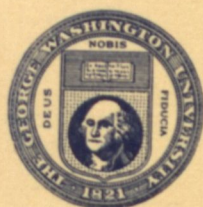
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BULLETIN

THE SUMMER SESSIONS
1960



WASHINGTON 6, D. C.
JANUARY 1960

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THE SUMMER SESSIONS

WASHINGTON, D. C.

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CALENDAR OF THE 1960 SUMMER SESSIONS

Date	Day	Occasion
June 13	Monday	Registration for the eight-week term*
June 14	Tuesday	Classes begin
July 4	Monday	Independence Day. Holiday
Aug. 1	Monday	Last day for applying in the Office of Registrar for degrees to be conferred in October
Aug. 5	Friday	Eight-week term ends
		Last day for submitting, to the appropriate dean, theses of candidates for the Master's degrees to be conferred in October
Sept. 2	Friday	Last day for submitting, to the appropriate dean, dissertations of candidates for the degrees of Doctor of Education and Doctor of Business Administration to be conferred in October

THE LAW SCHOOL

June 6	Monday	Registration for both sessions
June 7	Tuesday	First session begins
July 4	Monday	Independence Day. Holiday
July 18	Monday	Last day of classes
July 19-21 ...	Tuesday through Thursday	First session examination period
July 22	Friday	Registration for students attending second session only
July 25	Monday	Second session begins
Aug. 1	Monday	Last day for applying in the Office of the Registrar for degrees to be conferred in October
Sept. 2	Friday	Last day of classes
Sept. 5	Monday	Labor Day. Holiday
Sept. 6-8	Tuesday through Thursday	Second session examination period

THE SCHOOL OF EDUCATION—SPECIAL SESSIONS†

June 13	Monday	Registration and first day of classes of the pre-session and twelve-week evening session
July 1	Friday	Pre-session ends

Registration for the academic year 1960-61 will be held September 22-24.

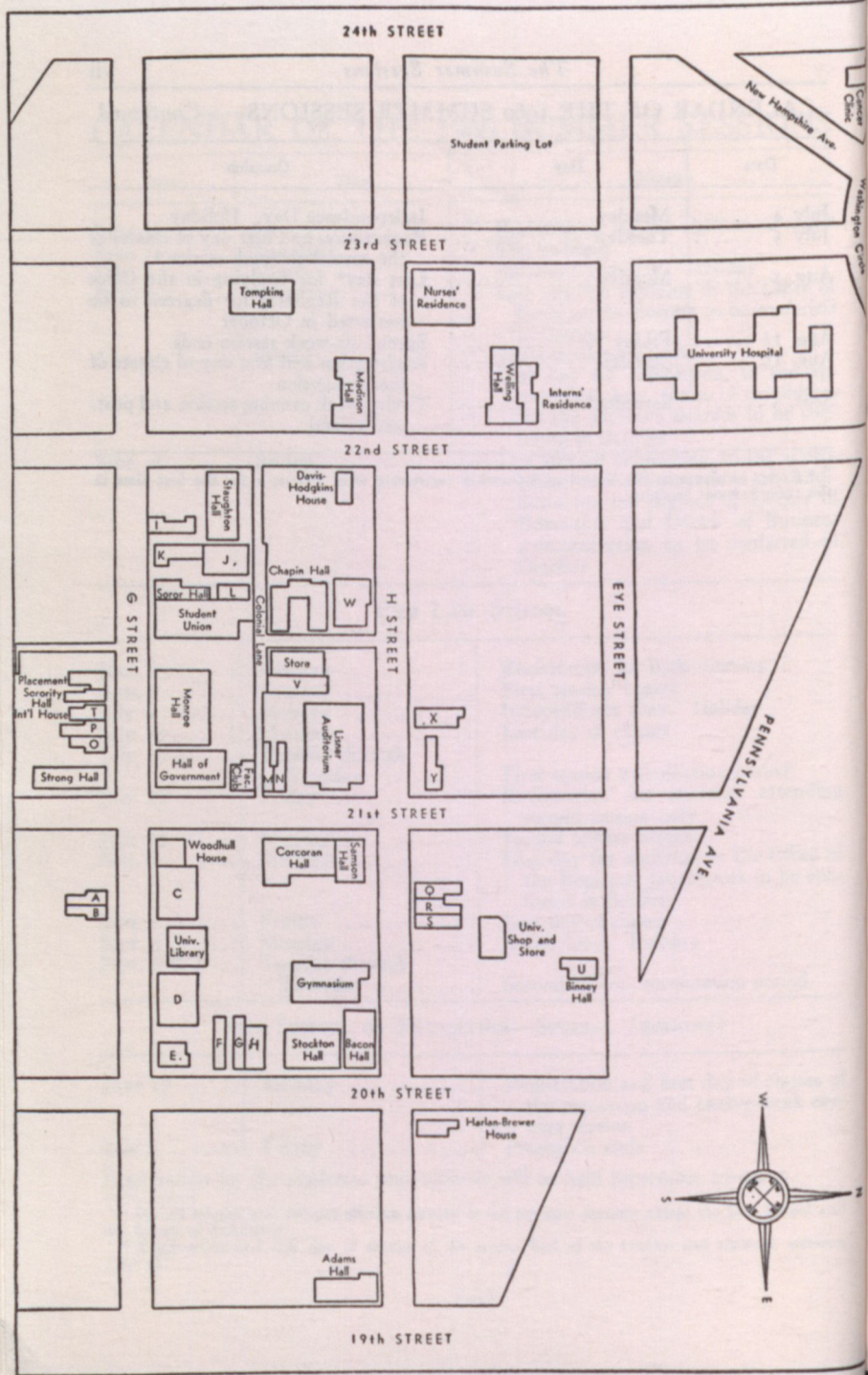
* For all schools and colleges offering courses in the Summer Sessions except the Law School and the School of Education.

† Registration and first day of classes of the second half of the twelve- and six-week sessions, July 25.

CALENDAR OF THE 1960 SUMMER SESSIONS—Continued

Date	Day	Occasion
July 4	Monday	Independence Day. Holiday
July 5	Tuesday	Registration and first day of classes of the special six-week session
Aug. 1	Monday	Last day* for applying in the Office of the Registrar for degrees to be conferred in October
Aug. 12	Friday	Special six-week session ends
Aug. 15	Monday	Registration and first day of classes of the postsession
Sept. 3	Saturday	Twelve-week evening session and post-session end

* Except students in the School of Education registering after August 1 for the first time in the 1960 Summer Sessions.



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The Board of Trustees of the University is composed of the President of the University ex officio, and the following persons by election:

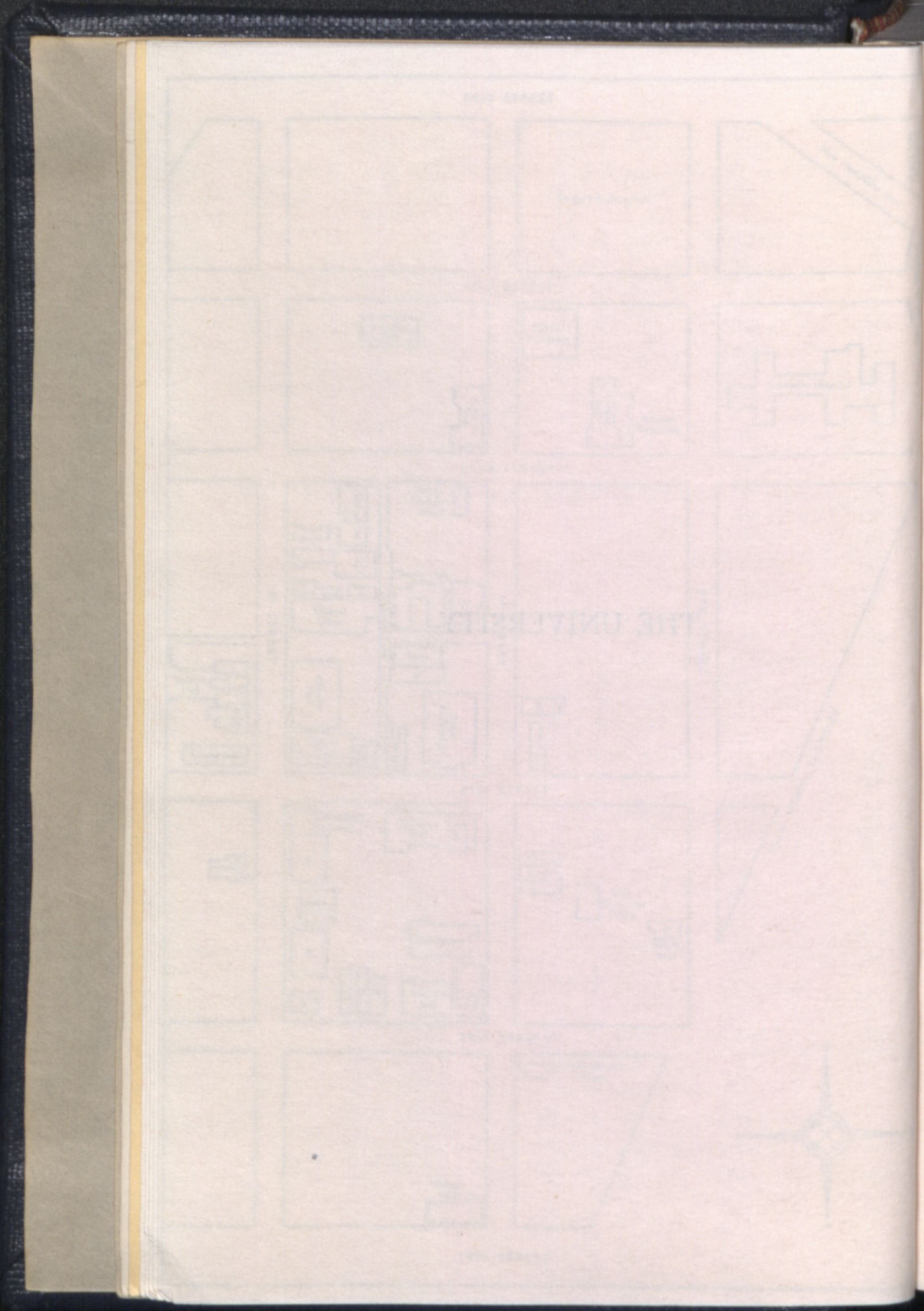
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THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

Columbian College in the District of Columbia was chartered by an act of Congress of February 9, 1821. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The George Washington University includes fourteen colleges, schools, and divisions, as follows:

The Junior College offers the work of the first two years of the four-year college program in the liberal arts and sciences and two years of preprofessional work. Each of these curricula leads to the degree of Associate in Arts. It also offers two-year terminal curricula. Those in Accounting and Secretarial Studies lead to the degree of Associate in Arts; those in Home Economics and Physical Sciences lead to the degree of Associate in Science.

Columbian College offers the work of the junior and senior years of the four-year college program in the liberal arts and sciences leading to the degrees of Bachelor of Arts and Bachelor of Science. In cooperation with the Department of Pathology and the University Hospital, Columbian College offers a course in Medical Technology leading to the degree of Bachelor of Science in Medical Technology. It also offers the studies leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

The Graduate Council offers a program of advanced study and research leading to the degree of Doctor of Philosophy.

The School of Medicine offers work leading to the degree of Doctor of Medicine.

The Law School offers professional and graduate courses leading to the degrees of Bachelor of Laws, Juris Doctor, Master of Laws, Master of Comparative Law, and Doctor of Juridical Science.

The School of Engineering offers courses leading to the degrees of

Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering, Master of Engineering Administration, Master of Science in Engineering, and Doctor of Science.

The School of Pharmacy offers courses leading to the degrees of Bachelor of Science in Pharmacy and Master of Science in Pharmacy.

The School of Education offers undergraduate programs leading to the degrees of Bachelor of Arts in Education, Bachelor of Science in Home Economics, and Bachelor of Science in Physical Education, and graduate studies leading to the degrees of Master of Arts in Education and Doctor of Education.

The School of Government offers undergraduate programs of study in Foreign Affairs, Public Affairs, Accounting, Business Administration, and Business and Economic Statistics, leading to the degree of Bachelor of Arts in Government. Graduate work is offered leading to the following degrees: Master of Arts in Government in the fields of Foreign Affairs, Public Affairs, Economic Policy, Accounting, Business and Economic Statistics, Counseling, and Psychometrics; Master of Arts in Public Administration; Master of Arts in Personnel Administration; Master of Business Administration in general business administration and in the field of Hospital Administration; and Doctor of Business Administration.

The College of General Studies supplements the adult education program of the University. Credit and noncredit courses, sponsored by the Off-Campus Division and the Division of Community Services are available throughout the year. The Off-Campus Division and the Campus Division offer programs leading to the degrees of Associate in Arts, Associate in Science, Bachelor of Arts, Bachelor of Science, Bachelor of Science in Cartography, and Master of Arts.

The Division of University Students makes available courses for mature students not candidates for degrees in this University.

The Division of Special Students makes available courses for students in the process of qualifying for degree candidacy.

The Division of Air Science offers a program of Air Force ROTC training which is integrated with the curricula of the colleges and schools of the University and leads to appointment as a commissioned officer in the United States Air Force Reserve.

The Summer Sessions.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association. The School of Medicine is a member of the Association of American Medical Colleges, and is one of the medical colleges which have been continuously approved by the American Medical Association. The School of Pharmacy is accredited by the American Council on Pharmaceutical Education as a Class "A" school. It is a member of the American Association of Colleges of Pharmacy. The School of Engineering is on the accredited list of the Engineers' Council for Professional Development. The School of Education is a charter member of the American Association of Colleges for Teacher Education and is accredited by the National Council for the Accreditation of Teacher Education.

LOCATION

The George Washington University is in downtown Washington, four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible to the University are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor; as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

EDUCATIONAL FACILITIES

Buildings, grounds, and equipment of the University are valued at approximately \$24,000,000. The buildings of the colleges, schools, and divisions offering Summer Sessions work are in the vicinity of Twenty-first and G Streets NW.

The University Library.—The University Library contains approximately 342,000 volumes and, with the exception of the law and medical collections, is housed in the Library Building.

Regulations governing the use of the library, the circulation of books, and the use of reserve books and periodicals are available at the service desks of the Library.

OTHER LIBRARY FACILITIES IN WASHINGTON

The student has access also to the Library of Congress, the Public Library of the District of Columbia and its branches, the Library of the Pan American Union, the Library of the Bureau of Railway Economics, the Library of the United States Department of Agriculture, the Library of the United States Office of Education, the National Library of Medicine, the Library of the Smithsonian Institution, and many other great special collections of the government departments.

RESEARCH FACILITIES OF WASHINGTON

The arrangement of the summer schedule of classes permits the full-time student to avail himself of the opportunity to study, at first hand, the working of the Federal Government and so to form a background for intelligent and useful citizenship.

In the departmental libraries of the Federal Government are a multitude of reports made by eminent specialists in all fields of science on the results of study and research in the bureaus, experimental stations, laboratories, museums, and observatories of the Nation.

In addition to the governmental collection the student has access to the research facilities of such scientific and educational groups, whose headquarters are situated in Washington, as the Carnegie Institution, the American Council on Education, the American Council of Learned Societies, the National Academy of Sciences, the National Research Council, the National Education Association, and the National Geographic Society.

THE SUMMER SESSIONS

1960

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The Library of the University of Washington

The library has been added to the Library of Congress, the Public Library of the District of Columbia and its branches, the Library of the University of California, the Library of the Bureau of Railway Economics, the Library of the United States Department of Agriculture, the Library of the United States Department of Education, the National Library of Medicine, the Library of the Smithsonian Institution, and many other great collections of the government departments.

The Library of the University of Washington

The University of Washington is a public institution of higher learning, and its library is one of the largest in the United States. It is a library of the people, and its collections are of the highest quality. The library is a part of the University, and its collections are of the highest quality. The library is a part of the University, and its collections are of the highest quality.

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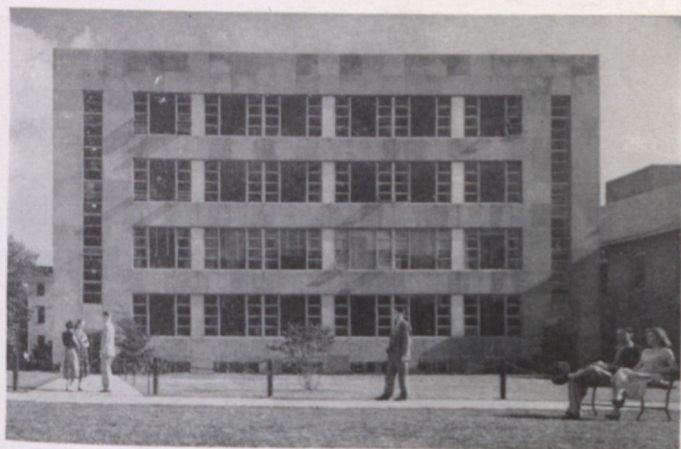
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Christine Verdross, A.B., *Associate in German*
Robert Corbin Vincent, Ph.D., *Professor of Chemistry*
Orville Hassler Walburn, A.B., LL.B., J.D., *Professor of Law*
Richard David Walk, Ph.D., *Associate Professor of Psychology*
John Patrick Walsh, Ed.D., *Professorial Lecturer in Education*
Donald Stevenson Watson, Ph.D., *Professor of Economics*
David Benson Weaver, A.B., LL.B., *Professor of Law*
Warren Reed West, Ph.D., *Professor of Political Science*
Harland Walter Westermann, Ph.D., *Associate Professor of Geography*
Hazel Emma Wilson, A.M., *Lecturer in Education*
Samuel Nathaniel Wrenn, Ph.D., *Professor of Chemistry*

THE SUMMER SESSIONS

The work of the Summer Sessions has been planned to meet the needs of full- and part-time students.

During the summer of 1960, courses are offered in the Junior College, Columbian College (the senior college), the Law School, the School of Pharmacy, the School of Education, and the School of Government.

ADMISSION

An applicant for admission must obtain from the Office of the Director of Admissions an application blank which he must fill out completely and return with the application fee of \$10 if applying as a degree candidate, \$5 if applying as a nondegree candidate. A recent photograph, with signature, of the applicant must be attached to the blank.

ENTRANCE REQUIREMENTS

The Student Seeking a Degree

An applicant from a secondary school must send the high school record form furnished by the University to his high school principal, with the request that the principal fill out the form and mail it direct to the Office of the Director of Admissions.

An applicant who has previously attended an institution of higher learning should request the registrar of that institution to mail direct to the Office of the Director of Admissions a transcript of his record. If he has attended more than one such institution he must request the registrar of each institution to send to the Office of the Director of Admissions a transcript of his record, *even though credits were not earned*, together with an honorable dismissal.

Entrance requirements are stated in this bulletin under the various colleges, schools, and divisions.

The Student Not Seeking a Degree

Students 21 years of age or over who are not interested in working for a degree in this University may be considered for admission to the Division of University Students to take courses for which they have adequate preparation, as evidenced by previous scholastic records.

Students under 21 years of age who meet the entrance requirements of the Junior College but who are not seeking degree candidacy at this University may be admitted to the Division of University Students to pursue programs of study approved by the Dean.

In special instances, with the permission of the instructor, a person

who has been admitted to the University may be registered as an auditor in a class without being required to take active part in the exercises or to pass examinations, but no academic credit will be allowed for such attendance. Students in good standing and matriculated for degrees in other institutions who wish to take certain courses in this University will be admitted to the Division of University Students for the summer only, to the extent that the facilities permit. In such cases transcripts of record are not required.

REGISTRATION

Before a student may register he must have satisfied the Office of Admissions that he is qualified to enter the University.

A student previously matriculated in the University but not in attendance during the term preceding this registration must file an application for readmission in advance of registration.

Registration for both sessions of the Law School summer term will be held June 6. *Summer students planning to take the New York Bar examination must register at this time for both sessions and complete both* Students wishing to attend the second session only should register on July 22. Tuition fees will be payable by the session.

For registration, students should report to the Office of the Registrar, Building C, 2029 G Street NW., between 10:00 A.M. and 8:00 P.M., on the dates stated in the Calendar.

CHANGES IN PROGRAM OF STUDY

Changes in programs of study may be made only with the permission of the adviser or major professor and the dean or director of the college, school, or division concerned.

FEES AND FINANCIAL REGULATIONS

By authorization of the Board of Trustees, the following fees have been adopted:

TUITION FEES

For each semester hour† for which the student registers (except for work in the Law School, for courses in Departments of Instruction in the School of Engineering, for courses in the College of General Studies Off-Campus Division, for work toward a Master's degree in Engineering, and for work taken by a candidate for a Doctor's degree)	\$22.00
For each semester hour for which the student registers in the Law School	23.00

* Registration for the Law School is conducted in Stockton Hall, 720 Twentieth Street NW.
 † Payment of tuition for the Master's thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered "in residence" during this period. If the preparation of the thesis extends beyond the second academic year, it must be registered for again, and tuition paid on the same basis as for a repeated course.

For each semester hour for which the student registers for courses in Departments of Instruction in the School of Engineering.....	24.00
For each semester hour for which the student registers in the Off-Campus Division of the College of General Studies.....	16.00
For the degree of Doctor of Philosophy, Doctor of Education, or Doctor of Business Administration:	
For work* leading to and including the Council Fellowship or General examination†	660.00
For work leading to and including the final examination†.....	660.00
For the degree of Doctor of Juridical Science:	
For work leading to and including the final examination†.....	660.00
For the degree of Master of Engineering Administration:	
For work leading to and including the Comprehensive Examination †	700.00
For the degree of Master of Science in Engineering:	
For work leading to and including the Comprehensive Examination †	800.00
For the degree of Doctor of Science:	
For work leading to and including the Qualifying Examination....	1,200.00
For work leading to and including the final examination.....	1,200.00

ADDITIONAL COURSE FEES

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are due with the tuition fee for the course. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee, the individual student will be required to pay such additional charges as are determined by the department concerned.

GRADUATION FEES

Wherein the degree of Associate in Arts or Associate in Science is granted	10.00
Wherein a degree other than the Associate in Arts or Associate in Science degree is granted	25.00
Wherein an Advanced Professional Certificate in Education is granted	25.00
FEE FOR BINDING MASTER'S THESIS.....	6.00
FEE FOR PRINTING SUMMARY OF DOCTORAL DISSERTATION.....	85.00

SPECIAL FEES

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	10.00
Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable	5.00
Application for Transfer fee, charged‡ each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable.....	5.00
Admission tests (when required).....	6.00-12.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program involving one course or more than one course	2.00
Withdrawal fee, charged each student who preregisters and withdraws prior to the regular registration.....	5.00
Service fee, charged each student for late payment of tuition (see "Payment of Fees").....	2.00

* This fee does not cover the cost of tuition for undergraduate courses numbered 1 to 100.

† When a limited schedule is carried which extends the time of completion of the program of study to more than one year, the proportionate part of the charge may be fixed by the Treasurer.

‡ Payable at the time of application for transfer or readmission.

Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees.....	5.00
For each examination to qualify for advanced standing and for each special examination	5.00
Laboratory checkout fee, charged each student in chemistry and pharmacy courses who fails to check out of the laboratory by the time set by the instructor.....	3.00
Transcript fee, charged for each transcript of record after the first...	1.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of the University library facilities, except as otherwise designated; (4) medical attention and hospital services described below. These privileges, with the exception of the issuance of transcripts, cease when the student withdraws or is dismissed from the University.

Medical and Hospital Services.—These services include: (1) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examinations; (2) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration. All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special services must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit does not apply to illness or disability incurred previous to the University term or prior to payment of tuition fees.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street, NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each session are due in advance at the time of registration.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Registrations are for the session, and no refunds or rebates are allowed unless the registration is in advance and the course is dropped before the day of registration for the session involved.

A student who preregisters and withdraws prior to the date of regular registration will be charged a withdrawal fee of \$5.

In no case will tuition be refunded because of nonattendance upon classes.

Payments apply only to the session for which registration charges are incurred, and in no case will these payments be credited to another session or term.

Any student in chemistry or pharmacy who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a laboratory check-out fee of \$3. A student dropping a course before the end of the session must check out of the laboratory at the next scheduled laboratory period.

No permission to withdraw and no certificate for work done will be given a student who has not a clear financial record.

UNIVERSITY REGULATIONS

Students in the Summer Sessions are subject to, and are expected to familiarize themselves with, the University regulations as stated in the general catalogue.

Academic Credit.—The Summer sessions are an integral part of the University. Academic credit for completed work will be given toward the appropriate degrees in the various colleges and schools of the University in accordance with their separate regulations and requirements.

Residence.—Summer Sessions work may be counted in residence but the candidate for a degree must satisfy the residence requirements of the school or college concerned as stated in the general catalogue.

Amount of Work.—No full-time student may take more than nine semester hours of work during the eight-week session; no employed student, more than six hours.

In the Law School the maximum amount of work that may be taken in both sessions by a full-time student is twelve semester hours; by an employed student, eight semester hours.

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the Student or the University, the University Administration deems it advisable to do so.

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

Detailed information concerning curricula; admission; scholarship requirements of the individual colleges, schools, and divisions; and requirements for degrees may be obtained from the general catalogue, which is available on request at the Office of the Director of Admissions.

For information concerning the hours at which courses will be offered, consult the Schedule of Classes for the Summer Sessions which will be available in May at the office of the Registrar.

VETERANS EDUCATION

The George Washington University is approved to provide training for eligible persons under the provisions of Public Laws 190, 16, 550, 894, and 634. The University Office of Veterans Education, Building Q, 2029 H Street NW., operates as a service bureau for such persons interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration.

Eligible persons are advised to consult this Office concerning the educational program of the University and the procedure for securing educational benefits before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D. C.

PUBLIC LAW 634

(War Orphans' Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

PUBLIC LAW 190

(World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1956, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

PUBLIC LAW 550

(Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950 and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

PUBLIC LAWS 16 AND 894

(Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to Veterans Administration for approval of their training objectives at least sixty days prior to registration.

STUDENT LIFE

SOCIAL AND RECREATIONAL PROGRAM OF THE UNIVERSITY

The summer social and recreational program includes regularly scheduled social, square, and folk dances on Lisner Terrace. For those who would like instruction and practice in dance, teaching sessions are provided. Get-acquainted teas and a carnival are also included in the program.

During the summer notices of the many recreational and social opportunities offered in the Capital will be posted on a bulletin board in the Student Union.

LIVING ACCOMMODATIONS

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance. Forms for application, together with detailed information, may be obtained from the Director of Activities for Women, Woodhull House, 2033 G Street NW, or the Director of Activities for Men, Building Q, 2029 H Street NW.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls, except freshmen, under the age of twenty-one who are en-

rolled for six or more credit hours of academic work at the university and who are not living with their parents or relatives, may live outside the dormitory only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Freshman girls may be domiciled outside the dormitory *only* with their parents or with immediate relatives with the written approval of their parents.

During the summer of 1960 the following residence halls will be open. Meals are served in the Student Union.

Women Students.—Dolly Madison Hall provides double rooms at \$37.50 a month a person.

Men Students.—John Quincy Adams Hall provides double rooms, with study alcove and bath, at \$40 a month a person.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor these groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

THE COLLEGES, SCHOOLS, AND DIVISIONS

Information concerning specific requirements for degrees is omitted from this bulletin. For such information the student is referred to the general catalogue.

THE JUNIOR COLLEGE

The Junior College, which administers the first two years of the usual four-year college program in the liberal arts and sciences was established in 1920, as a part of the academic reorganization of the University. Prior to 1920, two four-year programs had been administered by Columbia College since its organization in 1825.

The Junior College curricula combine the study of a general cultural course begun in the secondary schools, and lay a foundation for the more specialized work which is to follow.

The curricula offered in preparation for admission to Columbia College include the required work in the fields of arts and letters for the first two years of the Bachelor of Science in Medical Technology administered by Columbia College in collaboration with the Department of Pathology and the University Hospital.

The Junior College also provides the preprofessional work required for admission to the schools of Pharmacy, Education, and Government.

In addition it provides the following two-year curricula in vocational fields: Accounting, Hotel Management, Physical Education and Secretarial Studies.

The Degrees

The Junior College offers work leading to the degrees of Associate in Arts and Associate in Science.

Entrance Requirements

Admission to the University is based upon the certified evidence of the following factors:

1. The degree of preparation for admission from an accredited secondary school or from a combination of high school and college.

2. The student's statement that the applicant is adequately prepared to undertake college work with a reasonable prospect of success.

3. The student's ability to do college-level work, including the requirement of a minimum score of 70 on the entrance examination.

THE COLLEGES, SCHOOLS, AND DIVISIONS

Information concerning specific requirements for degrees is omitted from this bulletin. For such information, the student is referred to the general catalogue.

THE JUNIOR COLLEGE

The Junior College, which administers the first two years of the standard four-year college program in the liberal arts and sciences was established in 1930, as a part of the academic reorganization of the University. Prior to 1930, the four-year program had been administered by Columbian College since its organization in 1821.

The Junior College curricula continue the studies of a general cultural nature begun in the secondary schools, and lay a foundation for the more specialized work which is to follow.

The curricula offered in preparation for admission to Columbian College prepare students for advanced work in the fields of arts and letters and in science. They also serve as the first two years of the prelegal and premedical programs. The curriculum in Science meets the requirements for the first two years of the Bachelor of Science in Medical Technology curriculum offered by Columbian College in collaboration with the Department of Pathology and the University Hospital.

The Junior College also provides the preprofessional work required for admission to the schools of Pharmacy, Education, and Government.

In addition it provides the following two-year curricula in vocational training: Accounting, Home Economics, Physical Sciences, and Secretarial Studies.

THE DEGREES

The Junior College offers work leading to the degrees of Associate in Arts and Associate in Science.

ENTRANCE REQUIREMENTS

Consideration for admission is based upon the combined evidence of the following factors:

1. An acceptable certificate of graduation from an accredited secondary school showing a minimum of fifteen "units"*
2. The principal's statement that the applicant is adequately prepared to undertake college work with a reasonable prospect of success.

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

3. Scores of the Scholastic Aptitude Test of the College Entrance Examination Board

The Committee on Admission and Advanced Standing will consider the adequacy of the qualifications for academic success of an applicant who, because of unusual circumstances, does not present all of the formal requirements stated above. The Committee may prescribe appropriate tests as necessary.

COLUMBIAN COLLEGE

Columbian College, the senior college of liberal arts and sciences, comprises the work of the junior and senior years and the Master of Arts and Master of Science disciplines.

THE DEGREES

Columbian College offers work leading to the following degrees: Bachelor of Arts, Bachelor of Science, Master of Arts, Master of Science and Master of Fine Arts. In cooperation with the School of Medicine, Columbian College offers work leading to the combined degrees of Bachelor of Arts and Doctor of Medicine. In cooperation with the Department of Pathology and the University Hospital, Columbian College offers work leading to the degree of Bachelor of Science in Medical Technology.

UNDERGRADUATE MAJORS

Curricula leading to the degree of Bachelor of Arts are available in the following major fields:

American Thought and Civilization	Latin American Civilization
Art:	Mathematics
Art History and Theory, Drawing and Painting, Sculpture, and Commercial Art	Philosophy
Biology	Physics
Botany	Political Science
Chemistry	Psychology
Economics	Religion
English Literature	Sociology and Anthropology
French Language and Literature	Spanish American Literature
Geography	Spanish Language and Literature
Geology	Speech:
Germanic Languages and Literatures	Speech
History	Dramatic Art
Journalism	Statistics
	Zoology

Curricula leading to the degree of Bachelor of Science are available in the following major fields:

Biology	Mathematics
Botany	Physics
Chemistry	Statistics
Geology	Zoology

GRADUATE FIELDS

Graduate work leading to the degree of Master of Arts or Master of Science is offered in the following fields. In addition, programs can be arranged in combined fields subject to the approval of the Committee on Studies.

American Literary and Cultural History	Latin American Civilization
Anatomy	Mathematics
Art History and Criticism	Museology
Bacteriology	Pharmacology
Biochemistry	Philosophy
Biology	Physics
Botany	Physiology
Chemistry	Political Science
Chemotherapy	Psychology
Economics	Religion
English and American Literature	Religious Education
English Literature	Sociology and Anthropology
French Literature	Spanish American Literature
Geography	Spanish Language and Literature
Geology	Speech Correction
Germanic Languages and Literatures	Statistics
History	Zoology

Graduate work leading to the degree of Master of Fine Arts is offered in the fields of painting and of sculpture.

ENTRANCE REQUIREMENTS

For the Bachelor's Degrees.—The degree of Associate in Arts or Associate in Science based on the appropriate curriculum in the Junior College, or the equivalent, is required. Scholarship requirements may be somewhat higher than those for graduation from the Junior College.

For the Master's Degrees.—An approved Bachelor's degree from an accredited institution and a transcript of studies previously pursued, showing appropriate distribution of courses and a superior quality of work in the major field, are required.

THE GRADUATE COUNCIL

The Graduate Council offers work leading only to the degree of Doctor of Philosophy. There is no specified amount of graduate work required for this degree beyond the first full year of graduate study. However, each student may be assigned whatever additional graduate course work his committee deems essential to his doctoral program. A limited amount of this graduate work is offered by some departments in the Summer Sessions. A student wishing to work under the disciplines of the Graduate Council will consult the Dean of the Graduate Council for information concerning credentials and candidacy.

A pamphlet describing details of the Graduate Council program, together with a current list of fields of research offered by the Council, will be sent upon request to the Office of the Graduate Council.

THE LAW SCHOOL

The Law School offers work leading to the following degrees: Bachelor of Laws, Juris Doctor, Master of Laws, Master of Comparative Law, and Doctor of Juridical Science.

See "Registration," on page — for provisions applicable to students who plan to take the New York Bar examination.

ENTRANCE REQUIREMENTS

For the Degree of Bachelor of Laws.—A Bachelor of Arts or equivalent degree awarded upon completion of a four-year course in an approved college or university is required. The baccalaureate record must be of satisfactory quality and must include an acceptable distribution of courses. An applicant will not be admitted who has been in attendance at another law school and who is ineligible to return to that school in good standing. From the applicants, a selection will be made by the Committee on Admissions.

A legal aptitude test is required for the admission of candidates for the degree of Bachelor of Laws. Information regarding the taking of such test may be obtained from the Dean of the Law School or from the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey, which administers the Law School Admission Test at various centers of the United States four times a year. It is not necessary that formal application for admission to the Law School be made prior to taking the aptitude test.

The Juris Doctor degree is conferred as a recognition of completion with high rank of the full course, including experience in research and legal authorship. A student does not register as a candidate for this degree until his last year in the Law School.

For the Degree of Master of Laws.—A Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree from a member school of the Association of American Law Schools are required. Candidates for admission must have attained a B average on all work done for the Bachelor of Laws degree, except that, at the discretion of the Committee on Graduate Studies, applicants otherwise eligible may be admitted on proof of experience and attainment as an alternative.

For the Degree of Master of Comparative Law.—The following are required: (1) the successful completion of and graduation from a course

in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycée, or lyceo; and (2) graduation in law from a recognized foreign university where training was in Civil Law.

Doctor of Juridical Science.—The following are required: a Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree, earned with high rank, from a member school of the Association of American Law Schools, and outstanding capacity for scholarly work in the field of law.

Unclassified Students.—A person who is in good standing as a degree candidate in another law school which is a member of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student in order to earn credits for transfer to the other law school.

A person who is a member of the bar or a person, not a member of the bar, who is a graduate of a member school of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student.

Unclassified students participate in the work of the course and take examinations. Courses taken by unclassified students will not be credited toward degrees at this Law School.

Continuing Legal Education Students.—A simplified admission and registration procedure is provided for members of the bar desiring to register as continuing legal education students to take courses on a non-credit basis. Members of the bar desiring to register as degree candidates or as unclassified graduate students should file the regular application for admission form.

THE SCHOOL OF PHARMACY

The School of Pharmacy offers work leading to the degree of Bachelor of Science in Pharmacy.

ENTRANCE REQUIREMENTS

An Associate in Arts degree based on the curriculum in Pharmacy in the Junior College, or the equivalent, is required.

THE SCHOOL OF EDUCATION

The School of Education prepares teachers, counselors, and administrators for the higher ranges of educational service and offers opportunities to teachers of experience to extend their education. The schedule of courses is arranged to meet the needs of employed students as well as those able to devote full time to their studies. It offers both graduate and undergraduate work.

THE DEGREES

The School of Education offers work leading to the following degrees: Bachelor of Arts in Education, Bachelor of Science in Home Economics, Bachelor of Science in Physical Education, Master of Arts in Education, and Doctor of Education.

ENTRANCE REQUIREMENTS

For the Bachelor's Degrees.—The satisfactory completion of two years of approved college work, or graduation from an approved two-year normal school, or the equivalent, is required.

For the Master's Degree.—A Bachelor's degree from an accredited college, or the equivalent, and the approval of the Committee on Admission and Advanced Standing are required.

For the Advanced Professional Certificate.—The Bachelor of Arts degree in Education or the Bachelor of Science degree in Physical Education from the School of Education, or the equivalent from another institution of higher learning; a Master's degree, from an accredited institution of higher learning, at least two years of successful teaching experience, and a permanent teaching or administrative license are required.

For the Doctor's Degree.—A Master's degree from an accredited college, or the equivalent, and the approval of the Faculty of the School of Education are required.

THE SCHOOL OF GOVERNMENT

THE DEGREES

The School of Government offers work leading to the following degrees: (1) Bachelor of Arts in Government with a major in Foreign Affairs, Public Affairs, Accounting, Business Administration, or Business and Economic Statistics; (2) Master of Arts in Government with a major field in Foreign Affairs, Public Affairs, Economic Policy, Accounting, Business and Economic Statistics, Counseling, or Psychometrics; (3) Master of Arts in Public Administration; (4) Master of Arts in Personnel Administration; (5) Master of Business Administration in general business administration or in the field of Hospital Administration; (6) Doctor of Business Administration.

ENTRANCE REQUIREMENTS

For the Bachelor's Degree

Bachelor of Arts in Government.—An Associate in Arts degree based on the *Foreign Affairs, Public Affairs, Accounting, Business Administration, or Business and Economic Statistics* curriculum in the Junior Col-

lege, or the equivalent, and a quality-point index of 2.00 for the first two years' work are required.

For the Master's Degrees

A Bachelor's degree from an accredited college or university is required. A student from an unaccredited institution may be admitted at the discretion of the Committee on Admission and Advanced Standing, but will be required to take such extra work above the minimum requirements as may be prescribed.

Students admitted to candidacy must have attained a quality-point index of 3.00 (a *B* average) in their undergraduate major. An applicant whose scholastic average is below 3.00 in his major, or who lacks prerequisite courses, may be referred to the Division of Special Students to make up the deficiency.

Master of Arts in Government.—The applicant's undergraduate program must have included prerequisite courses, corresponding to an undergraduate major at this University, for the chosen field of graduate study.

Master of Arts in Public Administration.—An undergraduate major in a social science or equivalent work experience is required.

Master of Arts in Personnel Administration.—An undergraduate major in a social science or education, with the appropriate courses in psychology is required.

Master of Business Administration.—(1) In general business administration: an acceptable undergraduate major in Business Administration, or the equivalent, is required. Applicants who are deficient in such course work may be admitted and will be required to make up deficiencies over and above the normal Master of Business Administration program. (2) In the field of Hospital Administration: a Bachelor's degree from an accredited college or university is required. While a 3.00 average in the undergraduate major is expected, consideration will be given, in the selection of candidates, to personal qualifications, aptitude for hospital administration, and practical experience.

For the Degree of Doctor of Business Administration

A Master's degree in Business Administration or a related field, or the equivalent, and proficiency in Statistics and Accounting to the satisfaction of the Committee on Doctoral Studies are required.

COLLEGE OF GENERAL STUDIES

The College of General Studies offers off-campus credit and noncredit courses in any field in which there is sufficient demand and for which

instructional facilities can be made available. These courses will meet at the time and place most convenient for the students enrolled and may begin at any time of the year.

The College also provides degree-granting programs for mature persons whose background and experience is such that they should be matriculated in a college designed to meet individual needs.

The Division of Community Services consists of the George Washington University Reading Clinic and a program of popular noncredit courses, institutes, and lectures offered both on campus and off campus.

ENTRANCE REQUIREMENTS

Off-Campus Credit Courses.—A simplified procedure for admission and registration in off-campus courses is conducted at the first meeting of the class. Transcripts of previous academic work are not required. Registration is restricted to those whose qualifications would indicate that they are able to carry the course successfully. Admission to an off-campus course does not constitute admission to degree candidacy in the University.

Noncredit Courses.—In general, noncredit courses will be open to any individual interested in enrolling. When a noncredit course is organized at the request of some particular agency or group, admission may be restricted to the students recommended by the sponsoring organization. A limit on the size of classes may have to be imposed in order to maintain the quality of instruction.

THE DIVISION OF UNIVERSITY STUDENTS

The Division of University Students makes the work of the University, in its several colleges and schools, accessible to students 21 years of age or over who are not working toward a degree in this University.

Candidates for degrees in other colleges and universities attending the Summer Sessions of the University are registered in the Division of University Students.

Students under 21 years of age who meet the entrance requirements of the Junior College but who are not seeking degree candidacy at this University may be admitted to the Division of University Students to pursue programs of study approved by the Dean.

Adequate preparation to undertake the desired courses is required.

THE DIVISION OF SPECIAL STUDENTS

This is a non degree-granting division of the University in which the Director of Admissions may authorize the placement of students in the process of making up entrance deficiencies to degree-granting colleges and schools of the University.

COURSES OF INSTRUCTION

EXPLANATION OF COURSE NUMBERS

First-group courses.—Courses numbered from 1 to 100 are planned for the student in the freshman or sophomore year. With the approval of the adviser and the dean, they may also be taken by a junior or senior. In certain instances, they may be taken by a graduate student to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for the student in the junior or senior year. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the officer of instruction, and when the completion of additional work has been certified by the officer of instruction.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for the graduate student. They are open, with the approval of the officer of instruction, to the qualified senior; they are not open to the Junior College student.

In the Law School, first-year courses are numbered from 100 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and graduate courses, from 401 to 500.

INDICATION OF THE AMOUNT OF CREDIT

The number of hours of credit given for the satisfactory completion of a course is in most cases indicated in parentheses after the name of the course.

For information concerning the hours at which courses will be offered, consult the Schedule of Classes for the Summer Sessions which will be available in May at the office of the Registrar.

The University reserves the right to change or withdraw any of the courses of instruction listed.

ACCOUNTING

1 *Introductory Accounting* (3)

Kennedy

Basic principles underlying accounting records used by single proprietorships and partnerships; preparation of the work sheet and financial statements. Morning.

- 1-2 *Introductory Accounting* (3-3) Benson
First half: basic principles underlying accounting records used by single proprietorships and partnerships; preparation of the work sheet and financial statements. *Second half:* basic principles underlying accounting records used by corporations; introduction to valuation and amortization problems, cost accounting, and analysis and interpretation of financial statements. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor. Accounting 2 begins July 11. Evening.
- 101 *Cost Accounting* (3) Benson
 Theory and purposes of industrial cost accounting, treatment of systems of cost control and determination, analysis and interpretation of cost data. Emphasis will be on job order cost accounting. Prerequisite: Accounting 1-2. Evening.
- 111 *Financial Statement Analysis* (3) Kennedy
 Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1-2 or permission of the instructor. Morning.
- 115 *Survey of Accounting* (3) Pontius
 Accounting systems used by single proprietorships and corporations with emphasis on methods of compiling, analyzing, classifying, and summarizing accounting data. Valuation, amortization, and income determination problems. Not open for credit to Accounting or Business Administration majors. Evening.
- 132 *Accounting Theory* (3) Kurtz
 Development of basic accounting principles and concepts with special reference to the current thought expressed by the American Institute of Certified Public Accountants and the American Accounting Association. Prerequisite: 6 hours of Accounting. Evening.
- 191 *Advanced Accounting* (3) Kurtz
 Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121-22. Evening.
- 193 *Business Budgeting* (3) Pontius
 Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1-2. Morning.
- 275 *Internal Control and Auditing* (3) Kurtz
 Internal accounting controls; review and appraisal of accounting systems, procedures, and managerial policies with respect to their effectiveness and profitability. Emphasis on the use of internal control and auditing as an aid to management. Prerequisite: Accounting 171 or permission of the instructor. Evening.
- 299-300 *Thesis* (3-3) The Staff

COURSE OFFERED IN SPECIAL PROGRAM

In addition to the regular courses announced above, the University offers the following accounting course for students enrolled in special program.

3 *General Accounting* (3)

Pontius

For students in the Navy Graduate Comptrollership program only. Study of accounting systems used by single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

ART

ART HISTORY AND THEORY

1 *Art Appreciation* (3)

Kline

A consideration of the vocabulary, methods, and materials of creative expression in the fine arts. A study of the language and function of art in its various media, the development of styles, aesthetic principles, theories, and ideals in art through the ages. (Not intended for the prospective Art major.) Evening.

71 *Introduction to the Arts in America* (3)

Kline

Painting, sculpture, architecture, furniture, and the popular arts from the colonial beginnings to the 19th century. Morning.

72 *Introduction to the Arts in America* (3)

Kline

Painting, sculpture, architecture, and the popular arts during the 19th and 20th centuries. Afternoon

105 *Renaissance Art in Italy* (3)

Evans

The development of painting, sculpture, and architecture in 15th and 16th century Italy. Evening.

206 *Baroque Art in the North* * (3)

Evans

The development of painting, sculpture, and architecture in 16th and 17th century Holland, Flanders, Spain, France, Germany, and England. Morning.

DRAWING AND PAINTING †

21 *Basic Design* † (3)

Forsythe

Practice of the basic principles of design; creative exercise in various media to acquire the control of two- and three-dimensional form. Morning.

65 *Drawing and Painting I* (3)

Forsythe

Afternoon.

165 *Drawing and Painting II* ‡ (6)

Forsythe

Afternoon.

265 *Painting III* ‡ (6)

Forsythe

Afternoon.

BIOLOGY

1-2 *Survey in Biology* (3-3)

Bowman, Munson

Systematic study of the plant and animal kingdoms, with emphasis upon the interdependence of living things and their relations with their environments.

* May be taken for undergraduate credit with the approval of the instructor.

† Art 21 is prerequisite to all other studio courses.

‡ May be taken for 3 credit hours with the approval of the instructor.

Introduction to organic evolution, heredity, public health, and conservation. Material fee, \$7 for each half. Nine-week term. Biology 1 is not prerequisite to Biology 2. Biology 2 begins July 14 and ends August 15. Lectures, laboratories, and field trips—afternoon.

- 211-12 *Research in Cytology* (arr.) Bowman
Individual problems for advanced students interested in this field. Hours and credits to be arranged.
- 299-300 *Thesis* (3-3) Bowman

BOTANY

- 1 *General Botany* (3) Adams, Stevens
Study of the structure, activities, and development of the flowering plant; survey of the different kinds of plants, their evolution, ecological relationships, economic significance, and principles of inheritance. Material fee, \$7. Lecture and laboratory—morning.
- 2 *General Botany* (3) Adams, Stevens
Continuation of Botany 1. May be taken concurrently with Botany 1. Material fee, \$7. Lecture and laboratory—morning.
- 116 *Plant Growth* (3) HacsKaylo
Primarily for nonspecialists. Emphasis is on practical problems of growing and caring for plants. Prerequisite: Botany 1 or Biology 1, or permission of the instructor. Material fee, \$8. Lecture and laboratory—evening.
- 295 *Research* (arr.) The Staff
Hours, credits, and fees to be arranged.
- 299-300 *Thesis* (3-3) The Staff

BUSINESS AND PUBLIC ADMINISTRATION

BUSINESS ADMINISTRATION

- 101 *Business Organization and Combination* (3) Clayton
Simple and interrelated forms of business enterprise and their control by government. Morning.
- 102 *Fundamentals of Management* (3) Towson
Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking. Afternoon.
- 105 *Personnel Management* (3) Towson
Industrial personnel and manpower programs, organization and policy in personnel activities. Evening.
- 138 *Investments* (3) Shaffner
Analysis of factors of investment credit with application to different types of investments, proper selection of investments for various classes of investors, regulation. Prerequisite: Accounting 1-2. Evening.
- 141 *Principles of Marketing* (3) Prestwich
An introduction to marketing structure and its relation to the total economy, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies. Prerequisite: Economics 1-2. Evening.

- 153 *Principles of Personal Selling* (3) Prestwich
Basic principles that underlie personal selling and the practical application of these principles. Emphasis is given to the human factor. Career opportunities and the role of selling in our economy are also considered. Evening.
- 232 *Seminar in Business Finance* (3) Dockeray
Research in advanced financial problems. Evening.
- 278 *The Dynamics of Business* (3) Clayton
An analysis of the structure of American business, including a study of trend and cyclical change in economic activity and their bearing upon governmental policy. Evening.
- 291 *Seminar in Business Management* (3) Dockeray
Research on various phases of management as practiced in American industry. Evening.
- 299-300 *Thesis* (3-3) The Staff
Evening.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following business administration courses for students enrolled in special programs.

- 107 *Labor-Management Contracts* (3)
For students in the Air Force Advanced Management program only. Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations. Hours to be arranged.
- 191 *Business Reports and Analyses* (3) Turner
For students in the Navy Graduate Comptrollership program only.
- 268 *Management Engineering* (3) Clewlow
For students in the Air Force Advanced Management program only. Analysis of the techniques for initiation and implementation of management engineering programs, with emphasis on organization and methods surveys, including the study of work measurement, work simplification, management audits, and other management improvement programs.
- 269 *Readings and Conferences in Controllershship* (3) Johnson
For students in the Navy Graduate Comptrollership program only.
- 275 *Human Relations in Business* (3) Johnson
For students in the Navy Graduate Comptrollership program only.

PUBLIC ADMINISTRATION

- 212 *Case Studies in Administration* (3) Sommers
Analysis and discussion of problems in public management, approached by the group using primarily the case method. Evening.

- 231 *Public Personnel Management* (3) Sommers
Basic principles; structure and organization of personnel offices; responsibilities; inter-agency relationships; personnel staffing, training, and work measurement. Evening.
- 251 *Governmental Budgeting* (3) _____
The role of budgeting in management; the principles and practices of budgetary formulation and administration. Evening.
- 297 *Seminar in Public Administration* (3) _____
Advanced research on various phases of public administration including methods of policy formulation and control, the application of systems to management, administration problems of bureaucratic relationships. Evening.
- 299-300 *Thesis* (3-3) The Staff
Evening.

COURSE OFFERED IN SPECIAL PROGRAM

In addition to the regular courses announced above, the University offers the following public administration course for students enrolled in the Air Force Advanced Management Program.

- 251 *Governmental Budgeting* (3) _____
The role of budgeting in management; the principles and practices of budgetary formulation and administration.

CHEMISTRY

- 11-12 *General Chemistry* * (4-4) Harkness
Elementary course in general chemistry. Prerequisite: one year of high school algebra. Students with credit for one semester of general chemistry (college level) may enter Chemistry 12 on July 14. Laboratory fee, \$18 for each half. Nine-week term ending August 15. Morning.
- 21 *Qualitative Inorganic Analysis* (4) Vincent
Theoretical and practical study of methods of separating and identifying the more common cations and anions using semi-micro techniques. Prerequisite: Chemistry 12. Laboratory fee, \$18. Eight-week term. Afternoon.
- 22 *Quantitative Inorganic Analysis I* (4) Schmidt
Theory and practice of quantitative analysis by typical volumetric and gravimetric procedures. Prerequisite: Chemistry 21. Laboratory fee, \$18. Eight-week term. Afternoon.
- 151-52 *Organic Chemistry* * (4-4) Wrenn, _____
Chemistry of the compounds of carbon. Prerequisite†: Chemistry 21. Chemistry 151 laboratory fee, \$11; Chemistry 152 laboratory fee, \$18. Students who have credit for Chemistry 151 may enter Chemistry 152 on July 14. Nine-week term ending August 15. Morning.

* Full-year course; credit is not given until the second half of course is completed.

† This prerequisite may be waived in the case of the student who has earned a grade of C or better in Chemistry 12 within the past two years.

295-96 *Research* (arr.) The Staff
 Research on problems approved by the Staff. Open to qualified students with advanced training. Laboratory fee, \$7.50 a semester hour. Hours and credits to be arranged.

299-300 *Thesis* (3-3) The Staff
 Laboratory fee, \$18 each half. Hours to be arranged.

ECONOMICS *

1 *Principles of Economics* * (3) _____
 Survey of the major economic principles, institutions, and problems in contemporary life. Morning and evening.

2 *Principles of Economics* (3) _____
 Continuation of Economics 1. Prerequisite: Economics 1. Morning and evening.

101 *Economic Analysis* (3) Watson
 Analysis of demand, supply, and commodity pricing; theory of national income determination; pricing of productive services; welfare economics. Morning.

121 *Money and Banking* (3) _____
 Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems. Afternoon.

181 *International Economics* (3) _____
 Survey of world economics, theories of international trade, analysis of international economic problems, and the international organizations. Evening.

213 *Economic Thought in the Twentieth Century* (3) Burns
 Continuation of Economics 201-2. The principal trends in economic thought during the present century. Evening.

219 *Managerial Economics* (3) Watson
 Analysis of price, production, and inventory policies of business firms. Evening.

251 *Theories of Economic Development* (3) _____
 Growth and change in economic activity, capital accumulation, innovations in technology and business organization. Evening.

299-300 *Thesis* (3-3) The Staff

COURSE OFFERED IN SPECIAL PROGRAM

In addition to the regular courses announced above, the University offers the following economics course for students enrolled in the Navy Graduate Comptrollership program.

195 *Government and Industrial Economics* (3) Watson
 Survey of national income, the financial system, international economics, and public economic policy.

* Economics 1-2 is prerequisite to all other courses in Economics.

EDUCATION

PRE-SESSION

June 13 to July 1

- 109A *Human Development, Learning, and Teaching* * (3) Baker
For the general student as well as the prospective teacher. Nature of human growth, development, and learning, illustrated by observation of children in learning situations. June 13 to 17: lecture—late afternoon; small group discussions and field work—evening. June 20 to July 1: lecture and conference—morning; small group discussions and field work—afternoon.
- 113 *Elementary School Art* * (3) Crump
For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Material fee, \$4.50. June 13 to 17: lecture—late afternoon; small group discussions and field work—evening. June 20 to July 1: lecture and conference—morning; small group discussions and field work—afternoon.
- 128 *Children's Literature* * † (3) Wilson
For teachers. Exploring and evaluating the newer books for children and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22. June 13 to 17: lecture—late afternoon; small group discussions and field work—evening. June 20 to July 1: lecture and conference—morning; small group discussions and field work—afternoon.
- 207 *Curriculum Materials* * ‡ (3) St. Cyr
For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations. June 13 to 17: lecture—late afternoon; small group discussions and field work—evening. June 20 to July 1: lecture and conference—morning; small group discussions and field work—afternoon.
- 219 *Elementary School Classroom Procedures* * ‡ (3) LaBue
Current classroom practices with particular emphasis on ways of planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences. June 13 to 17: lecture—late afternoon; small group discussions and field work—evening. June 20 to July 1: lecture and conference—morning; small group discussions and field work—afternoon.
- 245 *School and Community* * ‡ § (3) Angel
The school as an important member of a team of social agencies that builds the

* A workshop course requiring the full daytime attention of enrollees. Concurrent registration for another course scheduled in morning or afternoon not permitted.

† This course may not be taken by students who have completed or plan to enroll in Education 111.

‡ Prerequisite: adequate professional preparation.

§ This course may not be taken by students who have completed or plan to enroll in Education 121.

|| Enrollees fully employed may not register for another course.

This course may not be taken by students who have completed or plan to enroll in Education 245.

** Psychology 225 Seminar: *Mental Hygiene* and 228 Seminar: *Techniques of Counseling* will be offered as a part of the Special Six-Week Session. (See page 56.)

community. June 13 to 17: lecture—late afternoon; small group discussions and field work—evening. June 20 to July 1: lecture and conference—morning; small group discussions and field work—afternoon.

255 *Secondary Education** ‡ (3)

Root

Current proposals for the improvement of secondary education. June 13 to 17: lecture—late afternoon; small group discussions and field work—evening. June 20 to July 1: lecture and conference—morning; small group discussions and field work—afternoon.

TWELVE-WEEK EVENING SESSION

First Half—June 13 to July 22

109B *Human Development, Learning, and Teaching* || (3) Baker

For the general student as well as the prospective teacher. Nature of human growth, development, and learning, illustrated by observation of children in learning situations. Field work to be arranged. Evening.

121B *Society and the School* || # (3)

Rhodes

For the general student as well as the prospective teacher. The historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. Field work to be arranged. Evening.

Second Half—July 25 to September 2

110B *Human Development, Learning, and Teaching* || (3)

McCauley

For the general student as well as the prospective teacher. Nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations. Field work to be arranged. Evening.

122B *Society and the School* || (3)

Rhodes

For the general student as well as the prospective teacher. Organization and operation of schools; principles and functions; role of the teacher. Field work to be arranged. Evening.

SPECIAL SIX-WEEK SESSION **

First Half—July 5 to July 22

110A *Human Development, Learning, and Teaching** (3)

Detwiler

For the general student as well as the prospective teacher. Nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations. Lecture and conference—morning; small group discussions and field work—afternoon.

* ‡, ||, #, ** See footnotes on page 42.

- 114 *Elementary School Music* * (3) Reed
For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Lecture and conference—morning; laboratory and field work—afternoon.
- 117 *Elementary School Science* * † (3) St. Cyr
For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience. Lecture and conference—morning; small group discussions, laboratory, and field work—afternoon.
- 120 *Elementary School Arithmetic* * † (3) Baker
For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience. Lecture and conference—morning; small group discussions and field work—afternoon.
- 241 *Education of the Gifted* * ‡ (3) Jenkins
For the classroom teacher. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects. Lecture and conference—morning; small group discussions and field work—afternoon.
- 243 *Human Relations in the Classroom* * ‡ (3) Marinaccio
Principles and practices involved in interpersonal relationships between learner and teacher and among learners. Lecture and conference—morning; small group discussions and field work—afternoon.
- 256 *Secondary Education* * ‡ (3) Root
Current problems in each of the subject-matter fields. Lecture and conference—morning; small group discussions and field work—afternoon.

SPECIAL SIX-WEEK SESSION

Second Half—July 25 to August 12

- 112 *Guidance in Elementary Schools* * (3) McCauley
Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Education 109-10 and 121-22. Lecture and conference—morning; small group discussions and field work—afternoon.
- 115 *Teaching Reading in the Elementary School* * † (3) Huse
A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 109-10 and 121-22 or teaching experience. Lecture and conference—morning; small group discussions and field work—afternoon.
- 116 *Elementary School Social Studies* * † (3) Stratemeyer
For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience. Lecture and conference—morning; small group discussions and field work—afternoon.
- 121A *Society and the School* * # (3) St. Cyr
For the general student as well as the prospective teacher. The historical and sociological development of education at local, national, and international levels.

* , † , ‡ , # See footnotes on page 43.

cooperation of the school with other community agencies. Lecture and conference—morning; small group discussions and field work—afternoon.

- 225 *Elementary School Reading* * ‡ (3) Coleman
Developmental and remedial approaches to reading problems. Demonstrations of diagnostic and corrective techniques used by the classroom teacher and the reading specialist or supervisor. Lecture and conference—morning; small group discussions and field work—afternoon.

- 231 *Secondary School Classroom Procedures* * ‡ (3) Giancaspro
Survey of current classroom practices with particular attention to selected topics such as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques; teaching aids, etc.; review of recent literature. Lecture and conference—morning; small group discussions and field work—afternoon.

Full Period—July 5 to August 12

- 215 *Education of Exceptional Children* ‡ (3)
For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance. Morning.

- 218 *Contemporary Problems in Education* ‡ (3)
Social foundations of education—a study of the forces that shape the policies and offerings of the school. Morning.

- 229 *Administration of Elementary Education* ‡ (3) LaBue
For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action. Morning.

- 234 *Teaching Composition in the Junior and Senior High School* ‡ (3) Lumsden

For experienced teachers of English. Methods and materials for improving writing skills; exploring ways to achieve the goal of a theme a week as recommended in the Conant Report. Particular attention to successful techniques, standards of performance, methods of grading; use of style sheets and literary models, and the relationship of the study of grammar to writing. Early afternoon.

- 247 *Vocational Education* ‡ || (3) Walsh
Development in the United States, current conception, agencies involved, problems, and trends. Evening.

- 251 *Guidance in Secondary Education* ‡ (3) McDaniels
Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program. Late afternoon.

- 271 *The Teacher and School Administration* ‡ (3) Fox
A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions. Morning.

* , ‡ , || See footnotes on page 42.

- 275 *School Finance* ‡ || (3) Hutchins
Educational financial theory, practice, and control, including methods of financing. Evening.
- 280 *Adult Education* ‡ || (3) Detwiler
The adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs. Evening.
- 295 *Educational Research Methods and Procedures* (3) LaBue
Required of all Master of Arts candidates following Plan 2. Knowledge of elementary statistics required. Afternoon.
- 297 *Reading in Education* The Staff
To assist those preparing for the comprehensive examinations. No credit toward degree requirements. Tuition fee, \$22.

POST-SESSION

August 15 to September 3

- 122A *Society and the School* * (3) Elle
For the general student as well as the prospective teacher. Organization and operation of schools; principles and functions; role of the teacher. Lecture and conference—morning; small group discussions and field work—afternoon.
- 211 *Evaluation in Education* ‡ (3) McCauley
Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation. Lecture and conference—morning; small group discussions and field work—afternoon.

ENGLISH

ENGLISH COMPOSITION †

- A *English Practice* (3) Moore and Staff
Instruction, drill, and exercises in grammar, vocabulary, spelling, and mechanics in general; instruction and exercises in composition and reading. This course is designed to prepare students for English 1. Morning and evening.
- B *English for Foreign Students* (3) Alle
A course in reading and writing designed to prepare the student for English 1. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary. Evening.
- 1 *English Composition* † (3) Moore and Staff
Review of grammar, exercises in composition, readings. Morning and evening.

‡, ||, * See footnotes on page 42.

† Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared for English 1 will be assigned to English A.

All pre-Columbian College students (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, Spanish) will follow the sequence of English 1, both halves of one of the introductory literature courses, and English 4. English 2 is the second half of the six-hour composition course required of students not required to follow the pre-Columbian College sequence.

English 1 is prerequisite to all other courses in English.

- 2 *English Composition* † (3) Moore and Staff
Continuation of English 1. Morning and evening.
- 4 *English Composition* † (3) Moore and Staff
A course in critical analysis and practice of expository and argumentative techniques and in research procedure. This is the second half of the six-hour composition course required of students in the pre-Columbian College curricula. Prerequisite: English 1 and both halves of an introductory literature course. Morning.
- 11 *The Writing of Reports* (3) Turner and Staff
Theory and practice in the writing of technical reports. Evening.

ENGLISH LITERATURE *

- 51 *Introduction to English Literature* (3) Shepard and Staff
A historical survey. From beginnings to 1800. Morning and evening.
- 52 *Introduction to English Literature* (3) Shepard and Staff
A historical survey. Literature since 1800. Morning and evening.
- 122 *English Literature from the Beginnings to 1500* (3) Allee
Chaucer. Evening.
- 135 *Shakespeare* (3) Tupper
The histories and comedies. Morning.
- 162 *Victorian Literature* (3) Shepard
Poetry from 1830 to 1900. Evening.
- 165 *The Twentieth Century* (3) Linton
British poetry and criticism since 1900. Morning.
- 252 *Studies in the Romantic Movement* (3) Reesing
Critical theories and the poetry of Keats. Prerequisite: English 151-52 or the equivalent. Evening.

AMERICAN LITERATURE *

- 71 *Introduction to American Literature* (3) Cole and Staff
A historical survey. From beginnings to 1860. Morning and evening.
- 72 *Introduction to American Literature* (3) Cole and Staff
A historical survey. Literature since 1860. Morning and evening.
- 170 *The American Short Story* (3) Coberly
The historical development of the short story in America. Afternoon.
- 176 *American Drama* (3) Cole
Critical study of 20th century drama. Evening.
- 277 *Studies in American Fiction* (3) Coberly
Prerequisite: English 177-78 or the equivalent. Open to the undergraduate with approval of the instructor. Evening.

* English 51-52, 71-72, 91-92, Classified Languages and Literatures 71-72, French 51-52, German 51-52, Slavic Languages and Literatures 91-92, or Spanish 51-52 is prerequisite to all second-group courses except English 125.

† See footnote on page 46.

GEOGRAPHY

- 51 *Introduction to Geography* (3) Westermann
A study of place attributes and characteristics; patterns and associations of physical and cultural earth features. Morning.
- 52 *World Regions* (3) Campbell
The analysis of world regional divisions, description and interpretation of regional complexes, evaluation of regional differences as they affect the distribution and activities of man. Morning.
- 165 *Regional Intelligence* (3) Campbell
Kinds of geographic information required for a variety of intelligence purposes; systems of reporting. Evening.
- 251 *Population Pressure Areas* (3) Westermann
A study of those parts of the world which have become matters of international concern, because of their population pressures. An evaluation of the complex of factors which have created the "problems". Evening.

GERMANIC LANGUAGES AND LITERATURES *

- 1-2 *First-year German* (3-3) The State
The essentials of German grammar, translation of easy prose. Full-year course; credit is not given for German 1 until German 2 is completed. Aural training and oral practice in electronic language workshop. Workshop fee, \$6 each half. Second half begins July 11. Morning and evening.
- 3-4 *Second-year German* (3-3) The State
Selections from modern German prose, review of grammar. Full-year course; credit is not given for German 3 until German 4 is completed. Prerequisite: German 1-2 or two years of high school German. Second half begins July 11. Morning and evening.
- 49 *German Readings for Nonmajor Students* (3) Legner
Designed primarily for graduate students preparing for reading examinations. Undergraduates admitted with the permission of the instructor. No academic credit for graduate students. June 13 to July 11. Evening.

HISTORY ‡

- 39 *The Development of European Civilization* (3) Kayser
Primarily for freshmen. The political, social, economic, and cultural history of the Old World from ancient times to 1715. Morning.

* A standardized placement examination administered at registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination assignment is made to the appropriate course, with credit assigned on the usual basis.

† Students registering for German 1-2 must register for one lecture section and one workshop section for each half of the course. Change in workshop section requires a regular drop-add from the student's college or school.

‡ History 39-40 is prerequisite to courses 109 through 152 and 190 through 196; History 71-72, to courses 171 through 184; either History 39-40 or 71-72, to courses 161 through 166.

- 40 *The Development of European Civilization* (3) Thompson
Primarily for freshmen. The political, social, economic, and cultural history of the Old World from 1715 to the present. Evening.
- 71 *The Development of the Civilization of the United States* (3) Haskett
Primarily for sophomores. The political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. Morning.
- 72 *The Development of the Civilization of the United States* (3) _____
Primarily for sophomores. The political, social, economic, and cultural forces of the United States in their world setting from 1865 to the present. Evening.
- 130 *Nationalism* (3) Kayser
The historical evolution of modern Nationalism. Morning.
- 143 *History of Old Russia* (3) Thompson
A political and cultural survey of eastern Europe. The roots of Eurasian empire before Peter the Great, 862-1682. Morning.
- 164 *South America since Independence* (3) Davis
Development of the independent South American states in the 19th and 20th centuries. Evening.
- 172 *Social History of the United States* (3) Gray
Daily life, institutions, intellectual and artistic achievements of the Urban-Industrial Era, 1861 to the present time. Morning.
- 173 *Representative Americans* (3) Gray
A biographical approach to national history. Some fifty significant and pivotal personalities in the development of the United States in government, business, science, religion, journalism, the arts, and social reform. Morning.
- 176 *Political and Constitutional History of the United States* (3) Haskett
The programs and conflicts of group interests in America within the political and legal framework: from the Civil War to 1940. Morning.
- 181 *Diplomatic History of the United States to 1898* (3) _____
Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; and the activities of American secretaries of state and diplomatic agents. Evening.
- 199-200 *Proseminar: Readings for the History Major* (3-3) The Staff
Limited to majors in History. Hours to be arranged.
- 291-92 *Seminar* (3-3) Thompson
Prerequisite: approval of the Department. Hours to be arranged.
- 299-300 *Thesis* (3-3) The Staff
Required of all candidates for the Master's degree specializing in history. Hours to be arranged.

LAW

FIRST SESSION

June 7 to July 21

- 115 *Contracts I* (4) May
Mutual assent, offer and acceptance, consideration, parol evidence rule, Statute of Frauds, third party beneficiaries, assignments, conditions. Evening.
- 135 *Legal Method and Legal System* (4) Frye
Introduction to substantive and procedural law dealing with basic concepts; training in method and technique of case law and legislation using modern case records; practice in use of law books and in legal writing; importance of language in law; legal reasoning and use of precedents under doctrines of stare decisis, law of the case, and res judicata; development of Anglo-American legal system; organization of judiciary and bar, stressing enforcement of ethical standards. Evening.
- 145 *Personal Property* (2) Mallison
Concepts of property, including interests created by bailments, liens, and pledges; methods of acquiring ownership. Morning.
- 215 *Civil Procedure* (4) Walburn
Pleadings, discovery, joinder, forms of trial and related proof problems. Emphasis is on Federal Rules of Civil Procedure and other modern codes. Evening.
- 219 *Commercial Paper* (4) Orentlicher
Bills of exchange, promissory notes and checks, especially under the Negotiable Instruments Law. Evening.
- 251 *Insurance* (2)
The insurance device in life, property, and other risks. Morning.
- 265 *Law and Accounting* (2)
Introduction to elementary techniques and principles of financial accounting; relevance of accounting judgments to legal problems, legal judgments involved in problems affected by accounting principles and practice. Morning.
- 270 *Legislation* (2) Mallison
The legislative process and roles of various participants in the process; operation of the United States Congress and state legislatures, including fact finding, organization, and procedure; problems of statutory interpretation. Morning.
- 285 *Trusts and Estates* (4) Weaver
Formalities of execution of wills; problems of construction, revocation, contesting limits on testamentary power; intestate succession. Creation of trusts, inter vivos and testamentary; administration of decedents' estates and trust estates. Morning.
- 318 *Creditors' Rights* (4) Ledak
Remedies of unsecured creditors; judgments, fraudulent conveyances, creditors' agreements, equity and statutory receiverships, and bankruptcy. The general approach is that of law administration. Evening.
- 355 *Mortgages* (2) Bak
Security interests in real property, their creation, transfer, enforcement, and extinguishment. Evening.

380 *Suretyship* (2)

Baker

The law of suretyship, especially in the context of accommodation credit and commercial and financial practices, with attention also to informal and non-consensual suretyship relations and the place of suretyship principles in the solution of legal problems generally. Evening.

SECOND SESSION

July 25 to September 8

100 *Agency* (2)

Master and servant (status of agent), respondeat superior, nature of agency relation, actual authority, parties (disclosed and undisclosed principal), unauthorized transactions, notice, notification. Evening.

116 *Contracts II* (2)

Scope of protection afforded contracts; specific performance of contracts other than land transactions. Evening.

150 *Real Property* (4)

Historical background of the law of estates and conveyancing; types of estates; dower and curtesy; landlord and tenant relationship; concurrent estates; future interests at common law and after Statute of Uses; Rule against Perpetuities; incidents of divided ownership, as waste; natural rights. Evening.

160 *Torts* (4)

Merrifield

Liability for harm to persons or tangible things; defamation and invasion of privacy. Evening.

202 *Administrative Law* (4)

Davison

The position of the administrative process in the separation of powers, including the status of administrative personnel, administrative hearings, judicial scrutiny of administrative action, discretion, and rule-making—particularly as relating to federal administrative agencies. Morning.

230 *Conveyances* (2)

Benson

Conveyances, recording; easements, profits, covenants, and equitable servitudes; adverse possession and user. Morning.

235 *Domestic Relations* (2)

Potts

Marriage, annulment, and divorce; adoption and custody of children; economic relations. Morning.

240 *Evidence* (4)

Functions of court and jury; qualifications and examination of witnesses; opinion, relevancy, and scientific evidence; proof of writing; application of the hearsay rule. Evening.

279 *Taxation—Federal Income* (4)

Hambrick

Survey of substantive provisions of federal income tax, including concept of gross income, limitations on allowable deductions, problems of capital gains taxation, nontaxable exchanges of property, basis problems, provisions affecting the taxation of the family, and principles of income tax accounting. Evening.

309 *Conflict of Laws* (4)

Dixon

Legal problems arising from occurrences transcending state or national boundaries; jurisdiction; foreign judgments; constitutional influences; theoretical bases

of choice of law principles and their application to specific fields, including torts, contracts, property, family law, administration of estates, and business associations. Evening.

318 *Creditors' Rights* (4)

For course description, see first session. Morning.

376 *Restitution* (2)

Remedies at law and in equity for restitution of benefits conferred, especially as based on the concept of unjust enrichment. Morning.

MATHEMATICS

3 *College Algebra* (3)

Prerequisite: one year each of high school algebra and high school geometry. Morning and evening. The Sta

6 *Plane Trigonometry* (3)

Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3. Morning and evening. The Sta

12 *Analytic Geometry* (3)

Prerequisite: Mathematics 6; or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry. Morning and evening. The Sta

29 *Calculus I* (3)

Differentiation and integration of polynomial functions, with applications. Prerequisite or concurrent registration: Mathematics 12. Morning and evening. The Sta

30 *Calculus II* (3)

Differentiation and integration of transcendental functions with applications to solid analytic geometry, multiple integrals. Prerequisite: Mathematics 12 and 29. Morning and evening. The Sta

31 *Calculus III* (3)

Infinite series, partial differentiation, multiple integrals, introduction to vector concepts, improper integrals. Prerequisite: Mathematics 30 (or concurrent registration therefor), or Mathematics 20. Morning and evening. The Sta

111 *Mathematics for Engineers and Physicists I* (3)

Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 30 and 31. Evening. The Sta

112 *Mathematics for Engineers and Physicists II* (3)

Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 103, 111, or 132. Morning. The Sta

132 *Differential Equations* (3)

Prerequisite: Mathematics 31. Morning. The Sta

139 *Advanced Calculus* (3)

Prerequisite: Mathematics 31. Evening. The Sta

299-300 *Thesis* (3-3)

The Sta

PHARMACY

- 192 *Hospital Pharmacy: Prescription Practice* (1) Cooper
Prescription practice in the University Hospital Pharmacy. Prerequisite: Pharmacy 102. Laboratory—hours to be arranged.

PHILOSOPHY

- 51 *Introduction to Philosophy* (3) Schlagel
A critical examination of some of the problems of modern philosophy in relation to scientific and social developments since the Renaissance. Morning.
- 172 *American Philosophy* (3) Schlagel
A study of the thought of the great classic American philosophers: Peirce, James, Royce, Santayana, Dewey, and Whitehead. Evening.

PHYSICS

- 8 *General Physics* (3) Hobbs
This course, the fourth in the former sequence of courses in introductory physics (5, 6, 7, 8) will be offered for the last time in the summer of 1960 and is limited to students who have had Physics 7 or 13. Topics considered include electromagnetic waves (light, radio, and X-rays); atomic and molecular structure; radioactivity; nuclear physics; the quantum theory of matter and radiation; and the elementary particles such as electrons, protons, neutrons, and mesons. Prerequisite: Physics 6 and 7, or 13. Evening.
- 11 *Introductory Physics* (3) Koehl
An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by nonscience students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Material fee, \$11. First half of nine-week term—ends July 13. Afternoon.
- 12 *Introductory Physics* (3) J. M. Harrison
Mechanics, wave-motion, and sound. Prerequisite: Physics 11 (or former Physics 5). Material fee, \$11. Second-half of nine-week term—July 14–August 15. Afternoon.
- 13 *Introductory Physics* (3) (Replaces Physics 7) J. M. Harrison
Elementary electricity and magnetism. Prerequisite: Physics 12 (or former Physics 6). Material fee, \$11. Evening.
- 128 *Sound* (3) M. Harrison
Production, propagation, and detection of sound waves; vibrations of sounding bodies; acoustic instruments and acoustic measurements. Prerequisite: Physics 16 or 8, Mathematics 31 or 20. Evening.

POLITICAL SCIENCE *

- 9 *Government of the United States* * (3) Brewer, LeBlanc
The structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. Morning and evening.

* Six hours of first-group Political Science courses are prerequisite to all second-group courses.

- 10 *Government of the United States* * (3) LeBlanc
Analysis of the structure, powers, and operation of state and local government; civil rights, major functions of government at federal, state, and local levels. Evening.
- 107 *Problems in Modern Political Thought* (3) Kraus
Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries. Morning.
- 113 *Political Problems of the British Commonwealth of Nations* (3) Kraus
From Colonial Empire to modern Commonwealth: questions of equal partnership governments and policies in the principal Commonwealth states; problems of new states. Evening.
- 121 *The Constitution of the United States* (3) Wes
The judicial power of the federal courts in constitutional interpretation. Special attention to state-federal relationships, taxation, and legislative-executive judicial relationships. Morning.
- 145 *Political Parties and Politics* (3) LeBlanc
Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence of the President and Congress. Not open to students who have credit for former Political Science 116. Evening.
- 171 *International Politics* (3) Ludden
Basic forces underlying the conduct of international relations and the formulation of foreign policy: power politics, imperialism, collective security, and international cooperation. Morning.
- 172 *International Organization: The United Nations* (3) Ludden
Development and current operation of international organization within the system of sovereign states with emphasis on the United Nations. Evening.
- 178 *International Politics in the Western Hemisphere* (3) Davis
Political relations of the American Republics in the 19th and 20th centuries, the development of Pan Americanism and the Organization of American States. Evening.
- 181 *International Law* (3) Brewster
Survey of the public law of nations with particular emphasis on the law of peace. Morning.
- 212 *Seminar: Comparative Government* (3) Kraus
Selected topics and problems on comparative political and administrative institutions and the politics of modern constitutional governments and dictatorships. Each semester is devoted to a selected country or significant institutional policy problem. Evening.
- 279 *Reading Course in International Affairs* (3) Ludden
Reading and discussion of basic materials designed to stimulate investigation of problems in the nature and development of international law, politics, and organization. Evening.

* Six hours of first-group Political Science courses are prerequisite to all second-group courses.

- 281 *Seminar: International Law and Relations* (3) Brewer
Research topics in the public law of nations, with special attention to problems of pacific settlement, sanctions, war, neutrality, and state jurisdiction, and to their political implications. Evening.
- 299-300 *Thesis* (3-3) The Staff
Hours to be arranged.

PSYCHOLOGY *

- 1 *General Psychology* * (3) Johnson, Walk
The fundamental principles underlying human behavior. Morning and evening.
- 4 *Psychology of Adjustment* (3) Caldwell
Processes involved in the total adjustment of the individual, with emphasis on social environment; development in the individual of adjustment techniques. Evening.
- 22 *Introduction to Educational Psychology* (3) Tuthill
Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training. Morning.
- 29 *Child Psychology* (3) Johnson
A genetic approach to the study of the child. Morning.
- 8 *Abnormal Psychology* (3)
The causes, diagnosis, treatment, and prevention of the various types of maladjustment and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science. Evening.
- 129 *Introduction to Counseling and Guidance* (3) Sylvester
A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling. Evening.
- 131 *Psychological Tests* (3) Hunt
A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7. Morning.
- 144 *Personnel Psychology* (3) Mosé
The applications of psychology to personnel work in education, business, industry, and government. Evening.
- 151 *Social Psychology* (3) Tuthill
The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war. Evening.
- 193 *Readings in Psychology* (3) The Staff
Supervised readings on specific topics in psychology, with conferences, for undergraduate majors. Open only to seniors with 18 or more credits in psychology with a quality-point index of 3.00 or higher. Permission of staff member under whom course is to be taken is necessary. Hours to be arranged.
- 196 *History and Systems of Psychology* (3) Caldwell
A survey of the contemporary schools of psychology. Prerequisite: 12 credits in psychology. Evening.

* Psychology 1 is prerequisite to all other courses in Psychology.

- 202 *Psychological Research Methods and Procedures* (3) Wall
Required of all Master's candidates in psychology. Prerequisite: Experimental Psychology and an elementary course in statistics. Evening.
- 205 *Field Work in Psychology* (3) The Sta
Supervised field work in agencies providing psychological service. Admission by permission of the Executive Officer of the Department. Hours to be arranged.
- 207 *Readings in Psychology for Graduate Students* (3) The Sta
Supervised readings with conferences on specified topics in psychology. Permission of staff member under whom course is to be taken is necessary. Hours to be arranged.
- 244 *Seminar: Job Analysis and Evaluation* (3) Mos
Techniques for the development of work performed descriptions, qualification analysis, and job demands specifications. The evaluations and classification of jobs for the purpose of establishing wage structures. Evening.
- 295 *Research in Psychology* (arr.) The Sta
Hours and credits to be arranged.
- 299 *Thesis* (3) The Sta
Hours to be arranged.

COURSES OFFERED IN SPECIAL SIX-WEEK EDUCATION SESSION

- 225 *Seminar: Mental Hygiene* (3) Hu
A study of mental health problems with special attention to programs of prevention. July 5-22. Morning.
- 228 *Seminar: Techniques of Counseling* (3) Detwil
An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed. July 25-August 12. Morning.

COURSE OFFERED IN ENGINEERING ADMINISTRATION PROGRAM

- 145 *Principles of Human Relations* (3) Kotap
A basic course in the psychological principles underlying human relations. Evening.

RELIGION

- 9 *The Old Testament* (3) Jon
A historical and literary approach to the study of the books of the Old Testament with special consideration given to the development of religious institutions, and outstanding personalities. Morning.
- 59 *History of Religion* (3) Olmste
Primitive and ancient national religions; Confucianism, Taoism, Buddhism, Hinduism, and Shintoism—their historical setting, founders, and development of religious thought and culture. Evening.

- 60 *History of Religion* (3) Olmstead
Judaism, Christianity, and Islam—analysis of their origin, evolution, and contemporary status. Morning.
- 122 *Christian Ethics and Modern Society* (3) Jones
The nature and principles of the Christian life as developed by the Christian community; problems of personal conduct; the application of the Christian standard to family, social, and economic institutions. Evening.
- 291 *Readings and Research* (3) The Staff
Investigation of special problems in the history of religion. To be arranged.
- 299-300 *Thesis* (3-3) The Staff
To be arranged.

ROMANCE LANGUAGES AND LITERATURES *

FRENCH

- 1-2 *First-year French* (3-3) The Staff
For beginners. Pronunciation, grammar, composition, reading of modern French prose. Aural training, oral practice in electronic language workshop. Full-year course: credit will not be given for French 1 until French 2 is completed. Workshop fee, \$6 for each half.† Second half begins July 11. Morning and evening.
- 3-4 *Second-year French* (3-3) The Staff
Advanced grammar and composition, reading in modern French prose, introduction to French civilization. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 for each half.† Full-year course: credit will not be given for French 3 until French 4 is completed. Prerequisite: French 1-2 or two years of high school French. Second half begins July 11. Morning and evening.
- 9-10 *French Conversation and Composition* (3-3) The Staff
Workshop fee, \$4 for each half. Second half begins July 11. Morning.
- 49 *French Readings for Nonmajor Students* (3) The Staff
Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students. Evening.
- 129 *Contemporary French Literature* (3) The Staff
Existentialism in the novel and drama from 1938 to the present. Lectures, discussions, and reports. Evening.

* A standardized placement examination administered at registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination assignment is made to the appropriate course, with credit assigned on the usual basis.

† Students registering for French 1-2 or 3-4 or Spanish 1-2 or 3-4 must register for one lecture section and one workshop section for each half of the course. Change in workshop section requires a regular drop-add slip from the student's college or school.

SPANISH

1-2 *First-year Spanish* (3-3)

The Staff

For beginners. Pronunciation, grammar, composition, reading of modern Spanish prose. Aural training, oral practice in electronic language workshop. Full-year course: credit will not be given for Spanish 1 until Spanish 2 is completed. Workshop fee, \$6 for each half.* Second half begins July 11. Morning and evening.

3-4 *Second-year Spanish* (3-3)

The Staff

Advanced grammar and composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 for each half.* Full-year course: credit will not be given for Spanish 3 until Spanish 4 is completed. Prerequisite: Spanish 1-2 or two years of high school Spanish. Second half begins July 11. Morning and evening.

9-10 *Spanish Conversation and Composition* (3-3)

The Staff

Workshop fee, \$4 for each half. Second half begins July 11. Morning.

157 *Spanish American Literature since 1880* (3)

The Staff

The literature of Spanish America from 1880 to the contemporary period. Lectures, collateral reading, reports, and class analysis of important works. Evening.

SECRETARIAL STUDIES

11 *Elementary Shorthand and Transcription* (3)

Shorthand

A study of the principles of Gregg shorthand correlated with dictation and transcription. Minimum dictation speed of 60 words a minute attained. Laboratory fee, \$3. Evening.

15 *Advanced Shorthand, Typewriting, and Transcription* (3)

Shorthand

Dictation and transcription involving vocabularies in specific businesses. Minimum speed of 100 words a minute attained in dictation. Prerequisite: Secretarial Studies 12 or the equivalent. Laboratory fee, \$5. Evening.

SLAVIC LANGUAGES AND LITERATURES

1-2 *First-year Russian* (3-3)

Yakobson and Staff

Beginner's course in fundamentals of grammar and pronunciation, with graded reading, oral drill, and written practice. Full-year course: credit will not be given for Russian 1 until Russian 2 is completed. Workshop fee, \$6 for each half.* Second half begins July 11. Evening.

SOCIOLOGY AND ANTHROPOLOGY†

1 *Man in Modern Society* (3)

Lavell, Campbell

Development of culture and personality, the impact of groups and institutions on man's social behavior. Factors producing social problems; individual, community, national and international disorganization. Morning and evening.

* Students registering for Spanish 1-2 or 3-4 or Russian 1-2 must register for one lecture section and one workshop section for each half of the course. Change in workshop section requires a regular drop-add slip from the student's college or school.

† Sociology and Anthropology 1 or 51 is a prerequisite to all other courses in Sociology and Anthropology.

- 151 *Human Relations in Industry* (3) Lavell
Sociological analysis of work situations, occupational mobility, development of the labor movement, industrial leadership and morale. Evening.
- 152 *Dynamics of Culture* (3) Campbell
Factors and processes making for stability and change in culture; the nature of cultural growth, invention, diffusion, and acculturation; and the disintegration and reintegration of cultures. Morning.
- 295-96 *Research* (arr.) The Staff
- 299-300 *Thesis* (3-3) The Staff

SPEECH

- A *Speech Clinic* Pettit and Staff
Individual or group lessons, without academic credit, for such speech difficulties as lisping, cleft palate, articulatory problems, and stuttering. Fee: for individual lesson, \$7; for group lesson, \$4. Hours to be arranged.
- B *American Speech for Foreign Students* (3) Bielski
Class limited to foreign born students. Instruction in the formation of the sounds of spoken English, with emphasis on rhythm and inflection. The International Phonetic Alphabet is used. Analysis of individual voices through recordings. Recording fee, \$5. Evening.
- 1 *Effective Speaking* (3) The Staff
Preparation and delivery of extempore speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, \$2. Morning and evening.
- 11 *Training the Speaking Voice* (3) Leggette and Staff
Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of sounds of English and the standards of speech. Recording fee, \$4. Morning and evening.
- 32 *Oral Reading* (3) Leggette
Reading to others; theory and practice in the problems of interpreting the printed page. Prerequisite: Speech 11. Recording fee, \$2. Morning.
- 111 *Effective Speech Communication* (3) Bielski
The tools and principles of effective speech communication, including practice in the organization, delivery, and the evaluation of presentations commonly encountered by professional personnel. Not open to Speech majors. Evening.
- 121 *Group Discussion and Conference Leadership* (3) Henigan
The process of thinking and problem solving in committees and small groups, and the methods of leading discussions and conferences. Prerequisite: 6 hours of speech or the permission of the instructor. Morning.
- 177-78 *Clinical Practice in Speech Therapy* (1-1) Pettit, Bielski
Supervised case work in remedial speech—the University Speech Clinic, District of Columbia Crippled Children's Society, and Public School system. This course may be repeated for a total of 6 semester hours. Prerequisite: Speech 175 and permission of instructor. Hours to be arranged.

183-84 *Clinical Practice in Hearing Therapy* (I-I) Pettit

Supervised case work with persons handicapped with hearing losses—the University Speech Clinic, the Washington Hearing Society, and the Veterans Administration Audiology Clinic. This course may be repeated for a total of 3 semester hours. Prerequisite: Speech 182 and permission of instructor. Hours to be arranged.

295 *Research in Speech and Hearing* (arr.) The Staff299-300 *Thesis* (arr.) The Staff

STATISTICS *

51 *Introduction to Business and Economic Statistics* * (3) Johnson

Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9. Lecture and laboratory. Afternoon.

52 *Mathematics of Finance* (3) Johnson

Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation, building and loan associations. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9. Afternoon.

53 *Introduction to Statistics in Psychology and Education* * (3)

Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, profiles, norms and their use; frequency distributions, intelligence and other quotients, reliability and validity of tests, normal curve, correlation, elementary sampling, statistical error, limitations of statistics. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9. Lecture and laboratory. Morning.

91 *Principles of Statistical Methods* * (3) Thomas

Variates and attributes; measurement and enumeration; averages and dispersion; frequency distributions and their characteristics; correlation theory and applications; the making of statistical decisions. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9. Morning.

107 *Statistics for Engineers* (3) Bright

Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus. Evening.

117 *Analysis of Variance I* (3) Thomas

The analysis of variance to segregate factors producing significant variation; method to estimate experimental error, multiple classifications, Latin Square, Greco-Latin Square, factorials; an introduction to model theory. Applications are stressed. Prerequisite: Statistics 91. Laboratory fee, \$9. Evening.

118 *Correlation and the Chi-square Test I* (3) Thomas

A study of simple, partial, and multiple correlation. Rank correlation, the

* Credit is granted for only one of the following courses: Statistics 51, 53, and 91. Statistics 91 is for Statistics majors, for students in engineering and in the biological and physical sciences.

method of contingency, and analysis of covariance. Tests of independence, goodness, and goodness of fit. Applications are stressed. Prerequisite: Statistics 1. Laboratory fee, \$9. Evening.

Mathematical Probability (3) Johnson
Definitions, enumeration of cases, total and compound probability, repeated trials, Bayes' theorem and postulate, Bernoulli's theorem and its experimental verification, mathematical expectation, law of large numbers and its applications. Prerequisite: Mathematics 30, Statistics 91. Evening.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above the University offers the following courses in statistics for students enrolled in the special programs.

The Bases of Statistical Decision Making (3) Bright
For students in the Navy Graduate Comptrollership Program only. Introduction to the techniques of decision making, with emphasis on applications rather than theory. Includes: binomial distribution, normal distribution, Type I and II errors, estimation, research methodology, and problems of inference. Hours to be arranged.

Principles of Statistical Analysis (3) Bright
For students in the Air Force Advanced Management Program only. Introduction to the basic concepts of statistical analysis, measures of central tendency, dispersion, normal distribution, basic statistical inference including estimation and testing hypotheses. Examples utilizing actual case studies in so far as possible. Hours to be arranged.

ZOOLOGY

Introduction to Zoology (4-4) Mortensen, Desmond
An introduction to the study of the structure, functions, and relation of animals, and of the fundamental biological principles involved. Material fee, \$11 for each half. Nine-week term. Zoology 2 begins July 14 and ends August 15. Lecture and laboratory—evening.

Introduction to Vertebrate Embryology (3) Hansen
The origin and early development of the individual and the formation of organ systems. Emphasis is placed on the frog, chick, and pig, with reference to the human embryo. Material fee, \$11. Eight-week term. Lecture and laboratory—evening.

Research (3) The Staff
Investigation of special problems. Hours to be arranged.

Thesis (3) The Staff

THE GEORGE WASHINGTON UNIVERSITY

1821

The Junior College

1930

Columbian College (the Senior College)

1821

The Graduate Council

1893

The School of Medicine

1825

The Law School

1865

The School of Engineering

1884

The School of Pharmacy

1906

The School of Education

1907

The School of Government

1928

The College of General Studies

1950

The Division of University Students

1930

The Division of Special Students

1944

The Division of Air Science

1951

The Summer Sessions

1916

The University Hospital

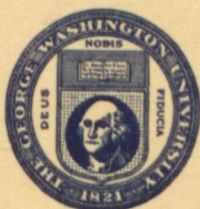
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1960-61



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BY THE UNIVERSITY

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No. 8

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WASHINGTON, D. C.

PUBLISHED IN 1917

MCMXVII

BY THE UNIVERSITY

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THE UNIVERSITY CALENDAR *

1960-61

Date	Day	Occasion
1960		
FALL SEMESTER:		
Sept. 6-16	Tues.-Fri.	Advising for all entering Junior College students
Sept. 12-21 ...	Mon.-Wed.	Advising in the School of Engineering for freshman, sophomores, and all new students
Sept. 15	Thurs.	Orientation Assembly for all new students
Sept. 16 and 19.	Fri. and Mon.	Placement tests for entering freshmen in the School of Engineering
Sept. 20	Tues.	Curriculum assemblies†
		Placement tests for colleges and Schools other than Engineering
		Examinations to qualify for advanced courses or waive curriculum requirements
Sept. 20 and 21.	Tues. and Wed.	Registration for graduate students in the School of Engineering‡
Sept. 21	Wed.	Meeting of the University Faculty
Sept. 22-24§ ..	Thurs.-Sat.	Registration*
Sept. 26	Mon.	Classes begin*
Oct. 7	Fri.	Last day for filing in the office of the appropriate dean subjects of theses for Master's degrees to be conferred in February
		Last day for submitting to the Dean S.J.D. dissertations of February candidates
Oct. 13	Thurs.	Stated meeting of the Board of Trustees
Oct. 22	Sat.	Fall Convocation
Oct. 31	Mon.	Last day for applying in the Registrar's Office for February graduation
Nov. 11	Fri.	Veterans Day. Holiday
Nov. 22	Tues.	Meeting of the Academic Council
Nov. 24-26	Thurs.-Sat.	Thanksgiving recess
Dec. 1	Thurs.	Last day for submitting to the Dean Ph.D. dissertations of February candidates

* In the School of Medicine registration is conducted September 15, classes begin September 19.
† All new students are expected to attend one Curriculum Assembly.
‡ From 11:00 A.M. to 8:00 P.M.
§ September 22 and 23, from 10:00 A.M. to 8:00 P.M.; September 24, from 10:00 A.M. to 1:00 P.M.

THE UNIVERSITY CALENDAR—Continued

Date	Day	Occasion
Dec. 8	Thurs.	Stated meeting of the Board of Trustees
Dec. 10	Sat.	Graduate Record Examination
Dec. 22-Jan. 2 .	Thurs.-Mon.	Christmas recess
1961		
Jan. 3	Tues.	Classes resume
		Last day for submitting to the appropriate dean theses of February Master's candidates
		Last day for submitting to the appropriate dean D.Sc., Ed.D., D.B.A. dissertations of February candidates
Jan. 18	Wed.	Last day of fall-semester classes
Jan. 20	Fri.	Inauguration Day. Holiday
Jan. 23-31	Mon.-Tues.	Examination period
Jan. 23-Feb. 1..	Mon.-Wed.	Advising in the School of Engineering for freshmen, sophomores, and all new students
Jan. 26	Thurs.	Placement tests for entering freshmen in the School of Engineering
SPRING SEMESTER:		
Jan. 31 and Feb. 1	Tues. and Wed.	Registration for graduate students in the School of Engineering*
Feb. 1	Wed.	Placement tests for colleges and schools other than Engineering
		Examinations to qualify for advanced courses or waive curriculum requirements
Feb. 2-4	Thurs.-Sat.	Registration†
Feb. 6	Mon.	Spring-semester classes begin
Feb. 9	Thurs.	Stated meeting of the Board of Trustees
Feb. 10	Fri.	Last day for filing in the office of the appropriate dean subjects of theses for Master's degrees to be conferred in June
		Last day for submitting to the Dean S.J.D. dissertations of June candidates
Feb. 22	Wed.	Winter Convocation. Holiday
Feb. 28	Tues.	Last day for applying in the Registrar's Office for June graduation
March 1	Wed.	Applications for fellowships for 1961-62 should be filed
March 9	Thurs.	Stated meeting of the Board of Trustees

* From 11:00 A.M. to 8:00 P.M.

† February 2 and 3, from 10:00 A.M. to 8:00 P.M.; February 4, from 10:00 A.M. to 1:00 P.M.

THE UNIVERSITY CALENDAR—Continued

Date	Day	Occasion
March 21	Tues.	Meeting of the University Faculty
March 31	Fri.	Last day for submitting to the appropriate dean Ph.D., Ed.D., and D.B.A. dissertations of June candidates
March 31- April 5	Fri.-Wed.	Easter recess
April 1	Sat.	Applications for scholarships for 1961-62 should be filed
April 8	Sat.	Graduate Record Examination
April 10	Mon.	Last day for submitting to the Dean theses and dissertations of Engineering June candidates
April 25	Tues.	Meeting of the Academic Council
April 28	Fri.	Last day for submitting to the appropriate dean (other than Engineering) theses of June Master's candidates
May 5	Fri.	Last day for submitting to the Dean S.J.D. dissertations of October candidates
May 11	Thurs.	Annual meeting of the Board of Trustees
May 17	Wed.	Last day of spring-semester classes
May 22-31	Mon.-Wed.	Examination period.
May 30	Tues.	Memorial Day. Holiday
June 4	Sun.	Baccalaureate Sermon
June 7	Wed.	Commencement
SUMMER SESSIONS:*		
June 19	Mon.	Registration for eight-week term
June 20	Tues.	Classes begin
July 4	Tues.	Independence Day. Holiday
Aug. 1	Tues.	Last day† for applying in the Registrar's Office for October graduation
Aug. 11	Fri.	Eight-week term ends
Sept. 8	Fri.	Last day for submitting to the appropriate dean theses of October Master's candidates
Sept. 21-23	Thurs.-Sat.	Last day for submitting to the appropriate dean Ed.D. and D.B.A. dissertations of October candidates
		Registration for fall semester of academic year 1961-62

*For all schools and colleges offering courses in the Summer Sessions except the Law School and the School of Education.

The dates of the calendar of the Law School will be announced.

The calendar for the special sessions of the School of Education is as follows: Presession, June 12-30; Twelve-week Evening Session, June 12-September 2; Six-week Session, July 3-August 11 (first half, July 3-21; second half, July 24-August 11); Postsession, August 14-September 1.

Registration for each of these sessions is on the first day of classes.

†Except students in the School of Education registering after August 1 for the first time in the 1960 Summer Sessions.

THE UNIVERSITY CALENDAR

Day	Month	Event
Monday	Jan	First day of the year
Tuesday	Jan	Second day of the year
Wednesday	Jan	Third day of the year
Thursday	Jan	Fourth day of the year
Friday	Jan	Fifth day of the year
Saturday	Jan	Sixth day of the year
Sunday	Jan	Seventh day of the year
Monday	Feb	Eighth day of the year
Tuesday	Feb	Ninth day of the year
Wednesday	Feb	Tenth day of the year
Thursday	Feb	Eleventh day of the year
Friday	Feb	Twelfth day of the year
Saturday	Feb	Thirteenth day of the year
Sunday	Feb	Fourteenth day of the year
Monday	Mar	Fifteenth day of the year
Tuesday	Mar	Sixteenth day of the year
Wednesday	Mar	Seventeenth day of the year
Thursday	Mar	Eighteenth day of the year
Friday	Mar	Nineteenth day of the year
Saturday	Mar	Twentieth day of the year
Sunday	Mar	Twenty-first day of the year
Monday	Apr	Twenty-second day of the year
Tuesday	Apr	Twenty-third day of the year
Wednesday	Apr	Twenty-fourth day of the year
Thursday	Apr	Twenty-fifth day of the year
Friday	Apr	Twenty-sixth day of the year
Saturday	Apr	Twenty-seventh day of the year
Sunday	Apr	Twenty-eighth day of the year
Monday	May	Twenty-ninth day of the year
Tuesday	May	Thirtieth day of the year
Wednesday	May	First day of the month
Thursday	May	Second day of the month
Friday	May	Third day of the month
Saturday	May	Fourth day of the month
Sunday	May	Fifth day of the month
Monday	Jun	Sixth day of the month
Tuesday	Jun	Seventh day of the month
Wednesday	Jun	Eighth day of the month
Thursday	Jun	Ninth day of the month
Friday	Jun	Tenth day of the month
Saturday	Jun	Eleventh day of the month
Sunday	Jun	Twelfth day of the month
Monday	Jul	Thirteenth day of the month
Tuesday	Jul	Fourteenth day of the month
Wednesday	Jul	Fifteenth day of the month
Thursday	Jul	Sixteenth day of the month
Friday	Jul	Seventeenth day of the month
Saturday	Jul	Eighteenth day of the month
Sunday	Jul	Nineteenth day of the month
Monday	Aug	Twentieth day of the month
Tuesday	Aug	Twenty-first day of the month
Wednesday	Aug	Twenty-second day of the month
Thursday	Aug	Twenty-third day of the month
Friday	Aug	Twenty-fourth day of the month
Saturday	Aug	Twenty-fifth day of the month
Sunday	Aug	Twenty-sixth day of the month
Monday	Sep	Twenty-seventh day of the month
Tuesday	Sep	Twenty-eighth day of the month
Wednesday	Sep	Twenty-ninth day of the month
Thursday	Sep	Thirtieth day of the month
Friday	Sep	First day of the month
Saturday	Sep	Second day of the month
Sunday	Sep	Third day of the month
Monday	Oct	Fourth day of the month
Tuesday	Oct	Fifth day of the month
Wednesday	Oct	Sixth day of the month
Thursday	Oct	Seventh day of the month
Friday	Oct	Eighth day of the month
Saturday	Oct	Ninth day of the month
Sunday	Oct	Tenth day of the month
Monday	Nov	Eleventh day of the month
Tuesday	Nov	Twelfth day of the month
Wednesday	Nov	Thirteenth day of the month
Thursday	Nov	Fourteenth day of the month
Friday	Nov	Fifteenth day of the month
Saturday	Nov	Sixteenth day of the month
Sunday	Nov	Seventeenth day of the month
Monday	Dec	Eighteenth day of the month
Tuesday	Dec	Nineteenth day of the month
Wednesday	Dec	Twentieth day of the month
Thursday	Dec	Twenty-first day of the month
Friday	Dec	Twenty-second day of the month
Saturday	Dec	Twenty-third day of the month
Sunday	Dec	Twenty-fourth day of the month
Monday	Jan	Twenty-fifth day of the month

THE BOARD OF TRUSTEES

OFFICERS AND COMMITTEES
OF THE UNIVERSITY

OFFICERS AND COMMITTEES
OF THE UNIVERSITY

THE BOARD OF TRUSTEES

The Board of Trustees of the University is composed of the President of the University ex officio and the following persons by election:

1960

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 Newell Windom Ellison, A.B., LL.B., LL.D.; 701 Union Trust Building
 *Brooks Hays, A.B., LL.B., LL.D.; Tennessee Valley Authority, Knoxville, Tennessee
 Alfred Henry Lawson, LL.B., LL.D.; 4901 Indian Lane
 John Keown McKee; 3901 Fifty-second Street
 Benjamin Mosby McKelway, Litt.D.; The Evening Star Building
 James Matlack Mitchell, A.M.; Brookings Institution
 *George Edward Muth, A.B., LL.B.; 1332 New York Avenue
 Donald D'Arcy Shepard, LL.B.; 1701 K Street
 Lewis L. Strauss, Sc.D., LL.D., L.H.D.; Mercury Building

1961

*Watson Davis, B.S. in C.E., C.E., Sc.D.; 1719 N Street
 Robert Vedder Fleming, LL.D., *Chairman Emeritus*; Riggs National Bank
 Charles Carroll Glover, Jr., A.M., LL.B., LL.D.; Riggs National Bank
 Edward Karrick Morris, LL.D.; 1701 Florida Avenue
 Godfrey Leon Munter, A.B., LL.B., LL.D.; Municipal Court for the District of Columbia
 *Frederick A. Reuter, M.D.; 1835 I Street
 James Edwin Webb, A.B., LL.D.; 1329 Eighteenth Street
 Alexander Wetmore, Ph.D., Sc.D.; Smithsonian Institution
 Watson W. Wise, Ph.B.; P. O. Box 297, Tyler, Texas

1962

*Daniel LeRay Borden, A.M., M.D., Sc.D.; 1835 I Street
 Wiley Thomas Buchanan, Jr.; United States Department of State
 Eugene Cassin Carusi, A.M., J.D.; Union Trust Building
 R. Roy Dunn; 929 E Street
 Philip L. Graham, A.B., LL.B., L.H.D.; The Washington Post and Times-Herald Building
 John Edgar Hoover, LL.M., LL.D.; United States Department of Justice

* Nominated by the alumni.

Frank Atherton Howard, B.S. in M.E., LL.B.; 30 Rockefeller Plaza,
New York City
Carleton D. Smith; 4001 Nebraska Avenue
Sidney William Souers, A.B., LL.D.; General American Life Insurance
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L. Corrin Strong, Ph.B., LL.D.; 1625 I Street
*Frank Harvey Weitzel, A.B., LL.B., General Accounting Office

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LL.D., Sc.D.
Gilbert Grosvenor, A.M., LL.D., Litt.D., Sc.D.
Walter Rupert Tuckerman, A.B., LL.B., LL.D.
Charles Stanley White, M.D., Sc.D.
Lloyd Bennett Wilson

Chairman of the Board of Trustees
Newell Windom Ellison

Secretary of the Board of Trustees
Edward Karrick Morris

Assistant Secretary of the Board of Trustees
Godfrey Leon Munter

* Nominated by the alumni.

STANDING COMMITTEES OF THE BOARD OF TRUSTEES

The Chairman of the Board of Trustees and the President of the University shall be members ex officio of each of the committees of the Board. The President of the University shall be Chairman of the Executive Committee.

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Mr. McKelway; Mr. Smith; Mr. Webb

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_____, *Dean of the Law School*

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Archibald Mulford Woodruff, Ph.D., *Dean of the School of Government*
Grover LaMarr Angel, A.M., Ed.D., *Dean of the College of General Studies*
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Warren Reed West, Ph.D., *Dean of the Division of Special Students*
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Alvin Edward Parrish, M.D., *Associate Dean of the School of Medicine*
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William Lewis Turner, Ph.D., *Assistant Dean of the Junior College*
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Anthony Charles LaBue, B.S., Ed.D., *Assistant Dean of the School of Education*
Walter Harold Hayes, Jr., A.M., *Assistant Dean in the College of General Studies*

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The Dean of Faculties, *Vice Chairman*
The Administrative Secretary
The Director of Admissions
The Registrar
The Librarian
The Dean in the Office of the President
The Associate Dean of Faculties

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The Dean of the College

Francis Edgar Johnston

Robert Corbin Vincent

COLUMBIAN COLLEGE

The Dean of the College

Fred Salisbury Tupper

Robert Dale Campbell

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Roderic Hollett Davison

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The Dean of the School

Paul Kenneth Smith

Angus MacIvor Griffin

THE LAW SCHOOL

The Dean of the School

Wallace John Baker

Jackson Reid Hambrick

THE SCHOOL OF ENGINEERING

The Dean of the School

Carl Hugo Walther

John Kaye

THE SCHOOL OF PHARMACY

The Dean of the School

THE SCHOOL OF EDUCATION

The Dean of the School

Joseph Henry Krupa

Carol Ruth St. Cyr

THE SCHOOL OF GOVERNMENT

The Dean of the School

John Withrow Brewer

John William Skinner

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The Dean of the College

THE DIVISION OF UNIVERSITY STUDENTS

The Dean of the Division

THE DIVISION OF SPECIAL STUDENTS

The Dean of the Division

THE DIVISION OF AIR SCIENCE

The Director of the Division

THE SUMMER SESSIONS

The Dean of the Summer Sessions

STANDING COMMITTEES OF THE FACULTY

COMMITTEE ON EDUCATIONAL POLICY

The President of the University, *Chairman*
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The Dean for Sponsored Research
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- WILLIAM FRANCIS ENOS, A.B., M.D., *Assistant Clinical Professor of Pathology*
- JEROME HAROLD EPSTEIN, A.M., M.D., *Clinical Instructor in Medicine*
- JULIUS ROBERT EPSTEIN, M.D., *Clinical Instructor in Obstetrics and Gynecology*
- RICHARD ERICSON, M.B.A., Ph.D., *Professor of Business Administration*
- MARGARET CLARA ETHIER, M.S., *Instructor in Chemistry*
- CLAYTON BERNARD ETHRIDGE, M.D., *Clinical Professor of Medicine*
- GROSE EVANS, B.F.A., Ph.D., *Professorial Lecturer in Art*
- HOWARD TASKER EVANS, JR., Ph.D., *Professorial Lecturer in Geology*
- JOHN BURNISON EVANS, A.B., LL.B., LL.M., *Lecturer in Law*
- JOHN MCCALLUM EVANS, A.B., M.D., *Professor of Medicine*
- DON CARLOS FAITH, Ph.D., *Professor of Educational Psychology; Director of Activities for Men; Director of Veterans Education*
- ROBERT FARIS, B.S., *Director of Men's Athletics*
- JOHN ANTHONY FARRELL, M.D., *Clinical Instructor in Psychiatry*

- CLAUD MAX FARRINGTON, A.M., *Assistant to the President*
PASQUALE JOSEPH FEDERICO, A.M., LL.B., *Associate Professorial Lecturer in Law*
HENRY LEON FEFFER, A.B., M.D., *Assistant Clinical Professor of Orthopedic Surgery*
JAMES JOSEPH FEFFER, A.B., M.D., *Associate Clinical Professor of Medicine*
WILLIAM ROBERT FELTS, JR., B.S., M.D., *Assistant Professor of Medicine*
LEON FERBER, A.B., M.D., *Assistant Clinical Professor of Psychiatry*
EDWARD EGNER FERGUSON, M.D., *Clinical Professor of Urology*
CLIFFORD DURAS FERRIS, M.S. in E.E., *Assistant Professor of Electrical Engineering*
ERIC FISCHER, Ph.D., *Professorial Lecturer in Geography*
DEWITT FISHER, M.E., A.M., *Lecturer in Physics*
GERALD JOHN FISHER, A.B., M.D., *Associate in Medicine*
LESTER WALTER FIX, M.D., *Associate in Pathology*
MICHAEL FLEISCHER, Ph.D., *Professorial Lecturer in Geology*
MARVIN PEACE FOOTER, A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*
CHARLES FORSYTHE, M.F.A., *Studio Lecturer in Art (Design)*
CHARLES WILLIAM FOULKE, A.B., M.D., *Clinical Instructor in Medicine*
RICHARD CROSMAN FOWLER, B.S., M.D., *Instructor in Medicine*
JAMES HAROLD FOX, A.M., Ed.D., *Professor of Education; Dean of the School of Education*
RAYMOND RICHARD FOX, M.S. in C.E., *Associate Professor of Civil Engineering*
MARY ALICE VANN FOX, A.B., M.D., *Clinical Instructor in Pediatrics*
CARSON GRAY FRAILEY, A.B., LL.B., *Associate Professorial Lecturer on Pharmaceutical Law*
RANDOLPH ADAMS FRANK, A.B., M.D., *Clinical Instructor in Psychiatry*
CLARENCE KENDALL FRASER, Ph.B., M.D., *Assistant Clinical Professor of Obstetrics and Gynecology*
MONROE HENRY FREEDMAN, A.B., LL.B., LL.M., *Assistant Professor of Law*
JOHN ANDREW FREY, Ph.D., *Assistant Professor of Romance Languages*
ADOLPH FRIEDMAN, A.B., M.D., *Associate in Medicine*
IRVING FRIEDMAN, Ph.D., *Lecturer in Geology*
JOSEPH MARSHALL FRIEDMAN, A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*
WILLIAM THOMAS FRYER, A.B., LL.B., J.D., *Professor of Law*
MARVIN FUCHS, B.S., M.D., *Associate in Medicine*

- JAMES LEO GAGNIER, A.B., LL.B., Major, United States Air Force, *Assistant Professor of Air Science*
- ROBERT ELEMER GAJDUSEK, A.M., *Assistant Professor of English*
- JAMES QUINCY GANT, JR., M.S., M.D., *Assistant Clinical Professor of Dermatology and Syphilology*
- LEROY MAXWELL GARRELL, B.S., Captain, United States Air Force, *Assistant Professor of Air Science*
- MARTIN AARON GARSTENS, A.M., Sc.D., *Lecturer in Engineering*
- CHARLES EDWARD GAUSS, Mus.B., Ph.D., *Elton Professor of Philosophy*
- ERVING FRANCIS GEEVER, M.D., Ph.D., *Associate Clinical Professor of Pathology*
- *HAROLD LORAN GEISERT, Ph.D., *Professor of Sociology and Anthropology*
- LYNDALE HARPSTER GEORGE, B.S. in P.E., A.M. in Ed., *Assistant Professor of Physical Education for Women*
- LEON GERBER, M.D., *Clinical Instructor in Surgery*
- JOHN GIANCASPRO, A.M. in Ed., *Lecturer in Education*
- FREDERICK HARRELL GIBBS, M.S., M.H.A., *Professor of Hospital Administration*
- SAM THOMPSON GIBSON, B.S., M.D., *Associate in Medicine*
- JOHN HENRY GILLIGAN, M.D., *Clinical Instructor in Ophthalmology*
- EUGENE SOLOMON GLADSDEN, B.S., M.D., *Assistant Clinical Professor of Medicine*
- MILTON SANFORD GLATT, A.B., M.D., *Clinical Instructor in Pediatrics*
- WILLIAM BAINBRIDGE GLEW, M.D., M.S., *Clinical Instructor in Ophthalmology*
- HERBERT ABRAHAM GOLDBERG, M.B., Ch.B., *Clinical Instructor in Urology*
- SEYMOUR ZONALD GOLDBLATT, B.S., M.D., *Clinical Instructor in Pediatrics*
- GEORGE JOSEPH GOLDSBOROUGH, B.S., J.D., *Associate Professorial Lecturer in Law*
- THOMAS ALPHONSE GONDER, B.S., M.D., *Assistant Clinical Professor of Medicine*
- REUBEN GOODMAN, M.D., *Associate in Dermatology and Syphilology*
- WILLIAM WOOLCOTT GOODRICH, LL.B., *Lecturer in Law*
- ROBERT SIRKOSKY GORDON, JR., A.B., M.D., *Clinical Instructor in Medicine*
- SAMUEL CHRABOLOWSKI GORDON, M.D., *Clinical Instructor in Psychiatry*

* On leave of absence fall semester 1960-61.

- CHARLES ERNEST GOSHEN, A.B., M.D., *Assistant Clinical Professor of Psychiatry*
- CONRAD GOSSELS, M.D., *Associate in Medicine*
- RAYMOND GEORGES GOTTSCHALK, B.S., M.D., *Assistant Clinical Professor of Pathology*
- ERNEST ALVA GOULD, B.S., M.D., *Clinical Instructor in Surgery*
- IRVING GRAY, Ph.D., *Professorial Lecturer on Isotopes*
- PAUL HOLLEY GRAY, B.S., M.D., *Assistant Clinical Professor of Psychiatry*
- WOOD GRAY, Ph.D., *Professor of American History*
- ROBERT MILTON GREENBERG, A.B., M.D., *Associate in Psychiatry*
- SAMUEL GREENHOUSE, Ph.D., *Associate Professorial Lecturer in Statistics*
- JOHN FRANCIS GREENSLADE, B.S., M.E.A., *Assistant Professor of Engineering Administration*
- ANGUS MACIVOR GRIFFIN, Ph.D., *Professor of Bacteriology; Associate Dean of the School of Medicine*
- NELSON THOMAS GRISAMORE, Ph.D., *Associate Professor of Electrical Engineering*
- ROBERT HENRY GROH, B.S., M.D., *Associate Clinical Professor of Neurology*
- MABEL HARLAKENDEN GROSVENOR, M.D., *Assistant Clinical Professor of Pediatrics*
- CHARLES GRUENWALD, A.B., M.D., *Clinical Instructor in Anesthesiology*
- EUGENE GUILLET, *Studio Lecturer in Art (Commercial Art)*
- ROBERT JEROME GUMNIT, A.B., M.D., *Associate in Physiology*
- MILTON GUSACK, A.B., M.D., *Assistant Clinical Professor of Medicine*
- MARGARET FRANCES GUTELIUS, A.B., M.D., *Assistant Clinical Professor of Pediatrics*
- EDWARD HACSKAYLO, Ph.D., *Lecturer on Plant Physiology*
- FRANKLIN PORTER HALL, Ph.D., *Professorial Lecturer in Engineering Administration*
- CHARLES ROBERT LEE HALLEY, A.B., M.D., *Clinical Professor of Medicine*
- JACKSON REID HAMBRICK, A.B., LL.B., *Associate Professor of Law*
- LLOYD WILLIAM HAMILTON, A.B., LL.B., *Professorial Lecturer in Accounting*
- LEVIN BARTOW HANIGAN, B.S., Ed.D., *Lecturer in Education*

- RAYMOND GEORGE HANKEN, B.S. in P.E., A.M. in Ed., *Associate Professor of Physical Education for Men*
- WILLIAM DONALD HANN, M.S., *Associate in Bacteriology*
- IRA BOWERS HANSEN, Ph.D., *Professor of Zoology*
- KEITH CYRIL HARDER, Ph.D., *Professorial Lecturer in Engineering Administration*
- JAMES WILLARD HARKNESS, B.S., Ed.M., *Associate Professor of Chemistry*
- ROBERT HOWE HARMON, A.B., M.D., *Associate University Physician*
- JEROME BLAINE HARRELL, M.D., *Assistant Clinical Professor of Surgery; Associate University Surgeon*
- DAVID WARNER HARRIS, A.B., M.D., *Clinical Instructor in Psychiatry*
- FOREST KLAIRE HARRIS, Ph.D., *Professorial Lecturer in Electrical Engineering*
- FOREST KLAIRE HARRIS II, B.S., M.D., *Clinical Instructor in Medicine*
- LOUIS JAMES HARRIS, A.B., LL.B., S.J.D., LL.M., *Professorial Lecturer in Law*
- ISABELLA HARRISON, A.B., M.D., *Associate in Surgery*
- JOHN MAY HARRISON, M.S., *Lecturer in Physics*
- MARK HARRISON, Ph.D., *Lecturer in Physics*
- CLARENCE RICHARD HARTMAN, A.B., M.D., *Associate Professor of Medicine*
- THOMAS LEES HARTMAN, A.M., M.D., *Associate in Medicine*
- *RICHARD CATLIN HASKETT, Ph.D., *Associate Professor of American History*
- JAMES LARRABEE HATLEBERG, A.B., M.D., *Clinical Instructor in Pediatric Psychiatry*
- GEORGE JOSEPH HAYES, B.S., M.D., *Associate in Neurological Surgery*
- WALTER HAROLD HAYES, JR., A.M., *Assistant Dean in the College of General Studies*
- MURDOCK HEAD, M.D., D.D.S., LL.B., *Assistant Clinical Professor of Surgery; Professorial Lecturer in Forensic Medicine; Chairman, Forensic Medicine Institute*
- ROBERT AARON HECHTMAN, M.S. in C.E., Ph.D., *Professor of Civil Engineering*
- LAURENCE HEILPRIN, Ph.D., *Professorial Lecturer in Engineering Administration*
- ROBERT ALEXANDER HEMMES, M.S., *Assistant Professor of Civil Engineering*

* On sabbatical leave spring semester 1960-61.

- COIT TAYLOR HENDLEY, JR., A.B., *Lecturer in Journalism*
 GEORGE FRANCIS HENIGAN, JR., Ph.M., *Professor of Speech*
 PHILIP FIELD HERRICK, A.B., LL.B., LL.M., *Professorial Lecturer in Law*
 HENRY WILLIAM HERZOG, B.S., *Treasurer of the University*
 HANS HEYMANN, JR., M.I.A., *Professorial Lecturer in Economics*
 GEORGE ALFRED HIGGINS, JR., B.S., M.D., *Clinical Professor of Surgery*
 FRANK HIGGINBOTHAM, M.S., C.P.A., *Professorial Lecturer in Accounting*
 PHILIP HENRY HIGHFILL, JR., Ph.D., *Associate Professor of English Literature*
 ELIZABETH HARMAN HILL, M.D., *Assistant Clinical Professor of Medicine*
 JOHN VINCENT HINKEL, M.S., *Lecturer in Journalism*
 HERMAN HEDBERG HOBBS, Ph.D., *Associate Professor of Physics*
 LEROY EDWARD HOECK, M.D., *Clinical Professor of Pediatrics*
 JOSEPH FREDERICK HOFFMAN, Ph.D., *Lecturer in Physiology*
 CHARLES ADRIAN MICHAEL HOGBEN, M.D., Ph.D., *Professor of Physiology*
 JOHN HOLDEN, Ph.D., *Professorial Lecturer in Education*
 THOMAS WILLARD HOLLAND, LL.B., Ph.D., *Professor of Labor Economics*
 NATASHA COFFIN HOLLBACH, Ph.D., *Assistant Professor of Chemistry*
 ARIEL CAHILL HOLLINSHEAD, Ph.D., *Assistant Research Professor of Pharmacology*
 PEARL HOLLY, M.S., M.D., *Associate Clinical Professor of Medicine*
 ALEC HORWITZ, M.S., M.D., *Clinical Professor of Surgery*
 NORMAN HAROLD HORWITZ, A.B., M.D., *Clinical Instructor in Neurological Surgery*
 NICHOLAS HOTTON, Ph.D., *Professorial Lecturer in Geology*
 HUGH OSGOOD HOUSE, A.B., M.D., *Associate University Physician*
 FREDERICK RUSSELL HOUSER, A.M. in Govt., *Registrar; Secretary of the Faculties*
 CHARLES EDWIN HOUSTON, Ph.D., *Professorial Lecturer in Business Administration*
 ROBERT LYNWOOD HOWARD, A.B., M.D., *Clinical Instructor in Medicine*
 WILLIAM ALLEN HOWARD, A.B., M.D., *Associate Clinical Professor of Pediatrics*
 JOHN STEWART HOWE, A.B., M.D., *Associate Clinical Professor of Pathology*

- JOHN DECATOR HOYLE, B.S., M.D., *Clinical Instructor in Surgery*
HENRY FURNESS HUBBARD, Ph.D., *Professorial Lecturer in Psychology*
KENNETH ANDREW HUBEL, A.M., M.D., *Associate in Physiology*
RUDOLPH HUGH, Ph.D., *Associate Professor of Bacteriology*
THELMA HUNT, Ph.D., M.D., *Professor of Psychology*
ZELLA MILLS HUSE, A.M., *Lecturer in Education*
FRANK HUSEMAN, *Studio Lecturer in Art (Commercial Art)*
CLAYTON HUTCHINS, Ph.D., *Professorial Lecturer in Education*
GEORGE IDELSON, B.S., *Lecturer in Business Administration*
VINCENT MICHAEL IOVINE, B.S., M.D., *Clinical Professor of Surgery*
NORMAN HARRY ISAACSON, A.B., M.D., *Clinical Instructor in Surgery*
JOHN ALEXANDER ISHERWOOD, Ph.B., M.D., *Assistant Clinical Professor of Radiology*
MARGARET IVES, Ph.D., *Professorial Lecturer in Psychology*
CAROLINE JACKSON, A.M., M.D., *Assistant Clinical Professor of Obstetrics and Gynecology*
JOHN WINGFIELD JACKSON, B.S., LL.B., *Adjunct Professor of Law*
ROBERT JACOBS, A.M., Ed.D., *Professorial Lecturer in Education*
MARSHALL HANNIS JACOBSON, A.B., M.D., *Assistant Professor of Medicine*
GILBERT CHESTER JACOBUS, B.S. in C.E., M.B.A., LL.B., *Professor of Public Administration*
RUTH ELIZABETH KERR JAKOBY, A.B., M.D., *Clinical Instructor in Neurological Surgery*
*BURNICE HERMAN JARMAN, A.M., Ed.D., *Professor of Education*
WILLIAM DABNEY JARMAN, B.S., M.D., *Assistant Clinical Professor of Urology*
HERBERT JEHL, Dr. Ing., *Professor of Physics*
GLADYS GARDNER JENKINS, A.M., *Associate Professorial Lecturer in Education*
JOE LEE JESSUP, M.B.A., *Professor of Business Administration*
ARLIN REX JOHNSON, Ph.D., *Professor of Business Administration*
EVA MAYNE JOHNSON, Ph.D., *Associate Professor of Psychology*
EVERETT HERSCHEL JOHNSON, Ph.D., *Professor of Statistics*
HOWARD ODIN JOHNSON, A.M., Ed.D., *Professorial Lecturer in Education*
THOMAS NICK JOHNSON, Ph.D., *Associate Professor of Anatomy*

*On leave of absence fall semester 1960-61.

- WARREN CHARLES JOHNSON, B.S., M.D., *Associate in Psychiatry*
FRANCIS EDGAR JOHNSTON, Ph.D., *Professor of Mathematics*
CHARLES WILSON JONES, A.B., M.D., *Assistant Clinical Professor of Medicine*
ROBERT GEAN JONES, B.D., Ph.D., *Assistant Professor of Religion*
BARNARD DEJEAN JOY, A.M., Ed.D., *Professorial Lecturer in Education*
ROBERT KONRAD KAHN, Ph.D., *Lecturer in Psychology*
PAULA REINES KAISER, M.B., Ch.B., M.D., *Associate in Anesthesiology*
KENNETH CASPER KATES, Ph.D., *Professorial Lecturer in Zoology*
MORTON SELWYN KAUFMAN, A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*
JOHN KAYE, M.S. in M.E., *Associate Professor of Engineering Administration*
ROBERT KAYE, A.M., *Associate Professorial Lecturer in Business Administration*
ELMER LOUIS KAYSER, Ph.D., LL.D., *Professor of European History; Dean of the Division of University Students*
CHARLES DUELL KEAN, A.B., S.T.B., D.D., *Lecturer in Religion*
WILMER DEAVER KEHNE, A.B., M.D., *Associate in Psychiatry*
GEORGE ARCHIBALD KELSER, JR., B.S., M.D., *Assistant Professor of Medicine*
JOHN KENEALY, A.B., M.D., *Clinical Instructor in Urology*
JOHN ALEXANDER KENDRICK, A.B., LL.B., *Clerk of the Trial Practice Court*
JOHN WHITEFIELD KENDRICK, Ph.D., *Professor of Economics*
MARVIN HAYNE KENDRICK, A.B., M.D., *Clinical Instructor in Surgery*
RALPH DALE KENNEDY, Ph.D., *Professor of Accounting*
THOMAS JAMES KENNEDY, JR., B.S., M.D., *Associate in Medicine*
ALBERT PRENTICE KENYON, A.M., *Lecturer in Physics*
IRVIN KERLAN, B.S., M.D., C.P.H., *Associate in Medicine*
JOHN MARK KESHISHIAN, M.D., *Clinical Instructor in Surgery*
ISRAEL KESSLER, M.S., M.D., *Associate in Medicine*
ALLEN OLAVI KEVARI, Staff Sergeant, United States Air Force, *Instructor in Air Science*
HARRY JAY KICHERER, M.D., *Assistant Clinical Professor of Radiology*
ELMER RICHARD KING, A.B., M.D., *Assistant Clinical Professor of Radiology*
JAMES CECIL KING, Ph.D., *Associate Professor of German*

- ROBERT AMENDT KINNEY, A.B., *Associate Professorial Lecturer in Political Science*
- ARTHUR HIRAM KIRACOPE, A.M., M.D., *Clinical Instructor in Psychiatry*
- HAYDEN KIRBY-SMITH, B.S., M.D., *Assistant Clinical Professor of Dermatology and Syphilology*
- VIRGINIA RANDOLPH KIRKBRIDE, A.M., Ed.D., *Director of Activities for Women*
- FRANCES KIRKPATRICK, A.M., *Professor of Home Economics*
- STANLEY WILLIAM KIRSTEIN, A.B., M.D., *Associate in Medicine*
- JACK KLEH, A.B., M.D., *Assistant Clinical Professor of Medicine*
- ELMER KLEIN, B.S., M.D., *Associate Clinical Professor of Psychiatry*
- MORRIS KLEINERMAN, B.S., M.D., *Associate Clinical Professor of Psychiatry*
- VINCENT KLEINFELD, LL.B., *Lecturer in Law*
- DONALD CHENOWETH KLINE, B.Arch., M.F.A., *Professor of Art*
- CALVIN TREXLER KLOPP, A.B., M.D. *Warwick Professor of Surgery (Cancer)*
- ALVIN KNUDSON, B.S., M.D., *Associate in Physical Medicine and Rehabilitation*
- GEORGE MARTIN KOEHL, A.M., *Professor of Physics; Dean of the Junior College*
- CHARLES KOELSCH, M.S., Ed.D., *Professorial Lecturer in Education*
- KURT WILLIAM KOHN, A.B., M.D., *Associate in Physiology*
- CHARLES JOSEPH KOKOSKI, Ph.D., *Associate Professor of Pharmacy*
- MARVIN CURTIS KORENGOLD, D.D.S., B.S., M.D., *Clinical Instructor in Neurology*
- WILLIAM ROBERT KOTAPISH, A.M., *Associate in Psychology*
- GUST GEORGE KOUSTENIS, B.S. in Phar., M.B.A., *Assistant Professor of Pharmacy Administration*
- WOLFGANG HERBERT KRAUS, Dr. Jur., S.J.D., *Professor of Political Science*
- JOSEPH LEO KRIEGER, Ph.D., *Professorial Lecturer in Business Administration*
- MORRIS EDWARD KRUCOFF, B.S., M.D., *Associate in Otolaryngology*
- JOSEPH HENRY KRUPA, M.S., Ed.D., *Professor of Physical Education for Men*
- SOLOMON KULLBACK, Ph.D., *Professorial Lecturer in Statistics*
- MORTON KUPPERMAN, Ph.D., *Lecturer in Statistics*
- WALTER KURLAND, B.S., M.D., *Clinical Instructor in Medicine*

- FREDERICK CHARLES KURTZ, M.B.A., C.P.A., *Associate Professor of Accounting*
- ANTHONY CHARLES LABUE, B.S., Ed.D., *Professor of Education; Assistant Dean of the School of Education*
- WILLIAM THURSTON LADY, M.D., *Associate in Obstetrics and Gynecology*
- RICHARD LAHEY, *Studio Lecturer in Art (Painting)*
- MANUEL LANDMAN, B.S., M.D. *Clinical Instructor in Dermatology and Syphilology*
- MONTAGUE LANE, M.D., M.S., *Clinical Instructor in Medicine*
- JOHN CARL LANG, A.M., Ed.D., *Associate Professorial Lecturer in Education*
- JOHN FRANCIS LATIMER, Ph.D., *Professor of Classical Languages and Literatures; Associate Dean of Faculties; University Marshal*
- JOHN WILMER LATIMER, JR., M.D., *Assistant Clinical Professor of Medicine*
- HENRY PRATHER LAUGHLIN, B.S., M.D., *Associate Clinical Professor of Psychiatry*
- CARR BARTLESON LAVELL, A.M., *Associate Professor of Sociology*
- CHARLES EDWARD LAW, M.D., *Associate in Medicine*
- HELEN BENNETT LAWRENCE, A.M., *Professor of Physical Education for Women*
- ARNOLD ALBERT LEAR, M.D., *Clinical Instructor in Medicine*
- HUGH LINUS LEBLANC, Ph.D., *Associate Professor of Political Science*
- GUST ANGELO LEDAKIS, B.B.A., LL.B., S.J.D., *Associate Professor of Law*
- LUDWIG GEORGE LEDERER, M.D., Ph.D., *Assistant Clinical Professor of Medicine*
- ROBERT STEVEN LEDLEY, D.D.S., A.M., *Associate Professor of Electrical Engineering*
- CHESTER ELWOOD LEESE, Ph.D., *Fry Professor of Physiology*
- LUBIN POE LEGGETTE, A.M., Ed.D., *Depew Professor of Speech*
- WOLFRAM KARL LEGNER, Ph.D., *Professor of German*
- HAROLD BERNARD LEHRMAN, A.B., M.D., *Clinical Instructor in Psychiatry*
- SANFORD LEON LEIKIN, M.D., *Associate in Pediatrics*
- LAURENCE PEREIRA LEITE, A.M., *Associate Professor of Art*
- EDWARD JOSEPH LEONARD, M.D., *Clinical Instructor in Medicine*

- ROBERT MEYER LEONARD, Ph.D., *Associate Professor of Pharmacology and Pharmacognosy; Assistant Dean of the School of Pharmacy*
- THOMAS MILES LEONARD, Ph.B., M.D., *Associate in Obstetrics and Gynecology*
- GORDON SPARKS LETTERMAN, B.S., M.D., *Associate Clinical Professor of Surgery*
- EDWARD HAROLD LEVINE, A.B., M.D., *Clinical Instructor in Medicine*
- JACK LOUIS LEVINE, M.D., *Assistant Clinical Professor of Otolaryngology*
- EDWARD LEWIS, M.D., *Clinical Professor of Pediatrics*
- EDWIN LEWIS, M.B.A., *Professorial Lecturer in Accounting*
- WILLIAM LEWIS, M.D., *Clinical Instructor in Medicine*
- HERBERT LEONARD LEY, JR., M.D., M.P.H., *Professor of Bacteriology*
- HERBERT JOSEPH LIEBESNY, J.D., *Associate Professorial Lecturer in Law*
- PAUL GLENWOOD LINAWEAVER, JR., M.S., M.D., *Associate in Physiology*
- CLYDE JOE LINDLEY, A.M., *Lecturer in Psychology*
- CALVIN DARLINGTON LINTON, Ph.D., *Professor of English Literature; Dean of Columbian College*
- LEON MCNEELY LIVERETT, B.S., M.D., *Clinical Instructor in Obstetrics and Gynecology*
- THOMAS PHILLIP GEORGE LIVERMAN, Ph.D., *Professor of Mathematics*
- GEORGE ADELBERT LIVINGSTON, Ph.D., *Lecturer in Botany*
- JEAN DOUGLAS LOCKHART, A.B., M.D., *Clinical Instructor in Pediatrics*
- JOHN HAYES LODGE, A.B., M.D., *Clinical Instructor in Ophthalmology*
- JAMES WALLING LONG, M.D., *Associate in Medicine*
- JOHN THOMAS LORD, A.B., M.D., C.M., *Clinical Instructor in Neurological Surgery*
- SAMUEL DENNIS LOUBE, A.B., M.D., *Associate in Medicine*
- REGINALD SPENCER LOURIE, B.S., M.D., Med. Sc.D., *Associate Clinical Professor of Pediatric Psychiatry*
- KERMIT MILTON LOVEWELL, B.S. in E.E., *Lecturer in Electrical Engineering*
- CARLOS LOZANO, A.B., *Assistant Professor of Romance Languages*
- HOWARD ROWLAND LUDDEN, A.M., *Assistant Professor of Political Science*
- VICTOR FREDERICK LUDEWIG, A.B., B.S., *Administrator of the University Hospital*
- FLORENCE MARY LUMSDEN, A.M., Ed.D., *Professorial Lecturer in Education*

- CUNNINGHAM RAMSEY MACCORDY, M.D., *Assistant Professor of Anesthesiology*
- GORDON RHODES MACDONALD, B.S., M.D., *Associate in Urology*
- RICHARD RAYNOR MACNABB, A.M., *Lecturer in Economics*
- ARCHIBALD RICH MACPHERSON, A.B., M.D., *Associate in Pediatrics*
- GEORGE MAKSIM, M.D., M.S. in Ped., *Assistant Clinical Professor of Pediatrics*
- *WILLIAM THOMAS MALLISON, JR., A.B., LL.B., *Professor of Law*
- BENJAMIN MANCHESTER, M.D., *Assistant Clinical Professor of Medicine*
- HAROLD GEORGE MANDEL, Ph.D., *Professor of Pharmacology*
- JAMES CHARLES MANDES, A.B., M.D., *Clinical Instructor in Medicine*
- JAMES PACKARD MANN, M.D., *Associate in Medicine*
- JOHN BAYNE MARBURY, M.D., *Associate in Medicine*
- ANTHONY MARINACCIO, Ph.D., *Professorial Lecturer in Education*
- COSIMO AJMONE MARSAN, M.D., *Associate in Neurology*
- WILLIAM LAVERNE MARSH, B.S., M.D., *Associate Professor of Pathology*
- ROBERT EDWARD MARTIN, M.D., *Associate in Pediatrics*
- SHIRLEY SUE MARTIN, A.B., M.D., *Associate in Obstetrics and Gynecology*
- THOMAS GUDGEL MARTIN, A.B., Captain, United States Air Force, *Assistant Professor of Air Science*
- JOHN RUSSELL MASON, A.M., M.S. in L.S., *Librarian; Curator of Art*
- MARTIN ALEXANDER MASON, B.S. in Eng., Ing.-Dr., *Professor of Civil Engineering; Dean of the School of Engineering*
- PETER MASTERS, *Studio Lecturer in Art (Commercial Art)*
- LOUIS HARKEY MAYO, B.S., LL.B., J.S.D., *Professor of Law; Dean of the Graduate School of Public Law*
- GUIDO ETTORE MAZZEO, A.M., *Associate Professor of Romance Languages*
- JOHN JOSEPH McAVOY, A.B., LL.B., LL.M., *Assistant Professor of Law*
- MARGARET KATHERINA McCABE, M.D., *Clinical Instructor in Medicine*
- WILLIAM GRAY MCCARTEN, M.S., *Assistant Professor of Bacteriology*
- DENNIS PARFREMENT MCCARTY, M.D., *Clinical Instructor in Surgery*
- WILLIAM ANDREW McCAULEY, Ph.D., *Associate Professor of Education*
- MURIEL HOPE McCLANAHAN, Ph.D., *Associate Professor of English Composition*

* On sabbatical leave 1960-61.

- RUTH McCLINTOCK, Ph.D., *Assistant Professor of Physiology*
KENNETH FREDERICK McCLURE, M.S., LL.B., *Professorial Lecturer on Commercial Law*
EDWARD MCCRENSKY, Ed.M., *Professorial Lecturer in Public Administration*
WILLIAM STANLEY McCUNE, A.B., M.D., *Clinical Professor of Surgery*
MABEL VIERLING McEWAN, A.B., *Associate in Physical Education for Women*
JAMES JERRY McFARLAND, JR., B.S., M.D., *Associate Clinical Professor of Otolaryngology*
JOHN ALBERT McINTIRE, A.B., LL.B., LL.D., *Professorial Lecturer in Law*
WILLIAM PRENTISS McKELWAY, A.B., M.D., *Assistant Professor of Obstetrics and Gynecology*
CLARENCE ARTHUR McLAUGHLIN, B.S., LL.B., *Professorial Lecturer in Accounting*
MARGARET WILLCOX McPHERSON, Ph.D., *Lecturer in Chemistry*
GEORGE ELBERT McSPADDEN, Ph.D., *Professor of Romance Languages*
CLAUDE YVES MEADE, Ph.D., *Associate Professor of Romance Languages*
FLORENCE MARIE MEARS, Ph.D., *Professor of Mathematics*
WILLIAM CAREY MELOY, M.D., M.S. in Med., *Associate in Surgery*
ROBERT ALLEN MENDELSON, M.D., *Clinical Instructor in Neurological Surgery*
MAURICE MENSCH, M.D., *Assistant Clinical Professor of Medicine*
LEROY SORENSON MERRIFIELD, A.B., LL.B., M.P.A., S.J.D., *Professor of Law*
*HOWARD MAXWELL MERRIMAN, Ph.D., *Professor of American Diplomatic History*
ARTHUR DONALD MERRITT, A.B., M.D., *Clinical Instructor in Medicine*
GEORGE WILCOX METCALF, M.D., *Clinical Instructor in Psychiatry*
JOSEPH LOUIS METIVIER, JR., A.M., *Assistant Professor of Romance Languages*
HERMAN ARNOLD MEYERSBURG, B.S., M.D., *Associate in Psychiatry*
JAMES RUSSELL MILES, SR., A.B., M.E.A., *Lecturer in Engineering Administration*
HILARY ETHEL CLARA MILLAR, L.R.C.P. and S.E., *Clinical Instructor in Pediatric Psychiatry*
FRANK NELSON MILLER, JR., B.S., M.D., *Associate Professor of Pathology*
RALPH BRETNAY MILLER, A.B., M.D., *Associate in Medicine*

* On sabbatical leave fall semester 1960-61.

- FRANCES WHA SHIK MIN, M.D., *Instructor in Pediatrics*
 REGINALD HENRY MITCHELL, M.D., *Clinical Instructor in Pediatrics*
 ALBERT JAY MODLIN, M.S., M.D., *Clinical Instructor in Pediatrics*
 ROBERT EMERSON MOFFAT, B.S. in C.E., M.C.E., *Lecturer in Civil Engineering*
 WILLIAM CORSON MOHLER, A.B., M.D., *Associate in Physiology*
 MARVIN IRWIN MONES, M.D., B.S., *Clinical Instructor in Pediatrics*
 GEORGE EDWARD MONK, A.B., LL.B., LL.M., *Professorial Lecturer in Law*
 MARGARET WHEELER MONTZKA, A.M., *Assistant Professor of Physics*
 MORROW HARRIS MOORE, JR., M.S. in M.E., *Assistant Professor of Mechanical Engineering*
 ROBERT HAMILTON MOORE, Ph.D., *Professor of English Composition*
 WILLIAM ROSS MORRIS, M.D., *Associate in Surgery*
 JOHN ANTHONY MORROW, A.M., *Lecturer in Business Administration*
 EDITH ELIZABETH MORTENSEN, Ph.D., *Professor of Zoology*
 JAMES NORMAN MOSÉL, A.M., *Associate Professor of Psychology*
 DELORA FOWLER MOTT, M.D., *Clinical Instructor in Neurology*
 EUGENE FRANCIS MULLIN, JR., A.B., LL.B., *Lecturer in Law*
 SAM CLARK MUNSON, Ph.D., *Associate Professor of Biology*
 ALBERT CHRISTIAN MURDAUGH, B.S., M.S. in Met.E., *Associate Professor of Mechanical Engineering*
 BERNARD WILLIAM MURPHY, M.B., Ch.B., *Clinical Instructor in Psychiatry*
 CORNELIUS FRANCIS MURPHY, B.S., M.D., *Instructor in Radiology*
 JAMES PETER MURPHY, B.S., M.D., *Assistant Clinical Professor of Neurological Surgery*
 JOSEPH PATRICK MURPHY, A.B., LL.B., LL.M., *Associate Professorial Lecturer on Commercial Law*
 FRANCIS JAMES MURRAY, B.S., M.D., *Assistant Clinical Professor of Medicine*
 FRANK HAMMETT MYERS, LL.B., LL.M., *Adjunct Professor of Law*
 WILLIAM HENRY MYERS, A.M., *Professor of Physical Education for Men*
 NTINOS MYRIANTHOPOULOS, Ph.D., *Clinical Instructor in Neurology; Associate Professorial Lecturer on Genetics*
 CHARLES RUDOLPH NAESER, Ph.D., *Professor of Chemistry*
 RALPH CLARKE NASH, JR., A.B., J.D., *Lecturer in Law*
 ANTHONY NASSNER, Technical Sergeant, United States Air Force, *Instructor in Air Science*

WALTER DRAPER NEIGHBORS, A.B., C.P.C.U., *Lecturer in Business Administration*

BERTLE NELSON, A.B., M.D., *Associate in Medicine*

NELS DAVID NELSON, Ph.D., *Professor of Mathematics*

JULIUS SALEM NEVIASER, A.B., M.D., *Assistant Clinical Professor of Orthopedic Surgery*

WILLIAM NEWMAN, A.B., M.D., *Associate Professor of Pathology*

JOSEPH NEY, B.S., M.D., *Assistant Clinical Professor of Medicine*

DORIS MARGARET NICHOLLS, Ph.D., M.D., *Associate in Physiology*

MARGARET MARY NICHOLSON, A.B., M.D., *Clinical Professor of Pediatrics*

ANDREW ANTHONY NILLES, A.B., LL.B., *Lecturer in Speech*

AARON NIMETZ, A.B., M.D., *Assistant Clinical Professor of Pediatrics*

GEORGE NORDLINGER, A.B., M.D., *Clinical Professor of Obstetrics and Gynecology*

EUGENIA CAMPBELL NOWLIN, A.M., *Associate Professorial Lecturer in Education*

CHARLES BERNARD NUTTING, A.B., J.D., LL.M., S.J.D., LL.D., Litt.D., L.H.D., *Professor of Law; Dean of the National Law Center*

JOSEPH ALOYSIUS O'CONNELL, LL.B., *Lecturer in Law*

MONTELL ERNEST OGDON, Ph.D., *Professorial Lecturer in Business Administration*

WILLIAM DAVID OLDHAM, B.S., M.D., *Clinical Instructor in Urology*

CLIFTON EARL OLMSTEAD, A.B., Th.D., *Professor of Religion*

BENNETT OLSHAKER, A.B., M.D., *Clinical Instructor in Pediatric Psychiatry*

CHARLES WILLIAM ORDMAN, A.B., M.D., *Associate in Medicine*

*HERMAN ISRAEL ORENTLICHER, A.B., LL.B., *Professor of Law*

JACK ORLOFF, M.D., *Associate in Medicine*

HAROLD HEACOCK ORVIS, B.S., M.D., *Assistant Professor of Medicine*

HEINZ DIETER OSTERLE, Studienreferendar, *Assistant Professor of German*

BERNARD HOWARD OSTROW, A.B., M.D., *Associate in Medicine*

GILBERT OTTENBERG, A.M., M.D., *Associate in Urology*

JOHN ATKINSON OWEN, JR., B.S., M.D., *Assistant Clinical Professor of Medicine*

RUSSEL SMITH PAGE, JR., A.B., M.D., *Associate in Otolaryngology; Medical Consultant to the Speech Clinic*

* On sabbatical leave fall semester 1960-61.

- HELEN PALLISTER, Ph.D., *Associate in Psychiatry (Psychology)*
 RICHARD EMERY PALMER, A.B., M.D., *Assistant Clinical Professor of Pathology*
 EUGENE ERNEST PANTZER III, Ph.D., *Assistant Professor of Slavic Languages and Literatures*
 EDWIN PEARSON PARKER III, B.S., M.D., *Assistant Clinical Professor of Medicine*
 KITTIE FENLEY PARKER, Ph.D., *Associate Professorial Lecturer on Plant Taxonomy*
 DEE RICH PARKINSON, M.D., *Clinical Instructor in Pathology*
 JOHN PARKS, M.S., M.D., *Professor of Obstetrics and Gynecology; Dean of the School of Medicine; Medical Director, University Hospital*
 ALVIN EDWARD PARRISH, M.D., *Associate Professor of Medicine; Associate Dean of the School of Medicine*
 ROBERT HAROLD PARROTT, M.D., *Clinical Professor of Pediatrics*
 SAM CHAPMAN PASCOE, A.B., M.D., *Associate in Medicine*
 HAROLD IRWIN PASSES, Med.B., B.Surg., *Clinical Instructor in Medicine*
 JOHN HOWELL PEACOCK, JR., B.S., M.D., *Associate in Pediatrics*
 HELEN GLICK PEARCY, A.B., M.S.W., *Clinical Instructor in Psychiatry (Social Work)*
 JED WILLIAMS PEARSON, JR., A.B., M.D., *Associate in Obstetrics and Gynecology*
 THOMAS MARTIN PEERY, A.B., M.D., *Professor of Pathology*
 GEORGE BERNARD PELLEU, JR., M.S., *Associate in Bacteriology*
 LOUIS ROBERT PERNA, A.B., M.D., *Clinical Instructor in Surgery*
 THEODORE PETER PERROS, Ph.D., *Associate Professor of Chemistry*
 JAMES HUTCHEON PERT, A.B., M.D., *Associate in Medicine*
 LEONARD THEODORE PETERSON, B.S., M.D., *Assistant Clinical Professor of Orthopedic Surgery*
 *CALVIN WEIR PETTIT, Ph.D., *Professor of Speech; Director of Speech Clinic; Assistant Dean of Columbian College*
 CARL HERMAN PFUNTNER, A.M., *Lecturer in Philosophy*
 JEROME PERCIVAL PICKARD, Ph.D., *Lecturer in Geography*
 GEORGE PIDA, B.E.E., *Lecturer in Electrical Engineering*
 HOWARD CLEMETH PIERPONT, A.B., M.D., *Assistant Professor of Surgery*
 LOIS IRENE PLATT, A.B., M.D., *Assistant Professor of Pathology (Cytology)*

* On sabbatical leave spring semester 1960-61.

- HAROLD PLOTSKY, B.S., M.D., *Clinical Instructor in Pediatric Psychiatry*
 EARL ELTON PONTIUS, JR., M.B.A., *Assistant Professor of Accounting*
 ROBERT SMALLWOOD POOLE, A.B., M.D., *Clinical Instructor in Medicine*
 EDWARD ANDREW POTTS, A.B., LL.B., *Lecturer in Law; Assistant Dean for Development in the Law School*
 DANIEL PRAGER, A.M., M.D., *Clinical Instructor in Psychiatry*
 ANDREW GABRIEL PRANDONI, B.S., M.D., *Associate Clinical Professor of Medicine*
 WARREN GODFREY PREISSER, A.B., M.D., *Clinical Instructor in Pediatrics*
 LEONARD PRESTWICH, Ph.D., *Associate Professor of Business Administration*
 NEEL JACK PRICE, B.S., M.D., *Associate in Obstetrics and Gynecology*
 MAURICE PROTAS, A.B., M.D., *Associate in Medicine*
 MERLE IRVING PROTZMAN, Ph.D., *Professor of Romance Languages*
 JOHN PROVAN, M.S., *Associate Professorial Lecturer in Business and Public Administration*
 HERBERT LAMONT PUGH, B.S., M.D., *University Physician*
 JOSE RAFAEL PUIG, M.D., *Clinical Instructor in Pediatrics*
 LAWRENCE ELIAS PUTNAM, A.B., M.D., *Assistant Clinical Professor of Medicine*
 HERBERT RABIN, Ph.D., *Lecturer in Physics*
 BORIS RABKIN, A.B., M.D., *Associate in Medicine*
 DAVID PLATT RALL, M.D., Ph.D., *Lecturer in Physiology*
 JOSEPH EDWARD RALL, M.D., Ph.D., *Assistant Clinical Professor of Medicine*
 JOSEPH EUGENE RANKIN, B.S., M.D., *Assistant Professor of Psychiatry*
 EDWARD LUKE REA, A.B., M.D., *Associate in Medicine*
 ADRIAN RECINOS, JR., B.S., M.D., *Associate in Pediatrics*
 JOHN ALTON REED, A.B., M.D., *Assistant Clinical Professor of Medicine*
 RAYMOND RAY REED, A.M., *Associate Professorial Lecturer in Education*
 JOHN PALMER REESING, JR., Ph.D., *Associate Professor of English Literature*
 THOMAS ELMER REICHELDERFER, B.S., M.D., M.P.H., *Associate Clinical Professor of Pediatrics*
 WILLIAM JENNINGS REINHART, B.B.A., *Associate in Physical Education for Men*
 MADALINE KINTER REMMLEIN, Ph.D., J.D., *Professorial Lecturer in Education*

- *EUGENE MARSHALL RENKIN, Ph.D., *Associate Professor of Physiology*
FREDERICK TURNER REUTER, M.D., *Assistant Clinical Professor of Urology*
FRANK MILLER REYNOLDS, LL.M., B.S., *Professorial Lecturer in Engineering Administration*
JACK JACOB RHEINGOLD, A.B., M.D., *Assistant Clinical Professor of Medicine*
HERSCHEL ELROY RICHARDSON, A.B., M.D., *Clinical Instructor in Medicine*
DUANE CASE RICHTMEYER, A.B., M.D., *Clinical Instructor in Surgery*
BARTON WINTERS RICHWINE, M.D., *Associate in Obstetrics and Gynecology*
FLOYD MILLARD RIDDICK, Ph.D., *Professorial Lecturer in Political Science*
NORMAN CHARLES RINTZ, A.B., M.D., *Clinical Instructor in Psychiatry*
HUGO VICTOR RIZZOLI, A.B., M.D., *Assistant Clinical Professor of Neurological Surgery*
JOHN WHITSON ROARK, B.S., M.D., *Clinical Instructor in Medicine*
JAMES WILLIS ROBB, Ph.D., *Associate Professor of Romance Languages*
JACOB ROBBINS, A.B., M.D., *Clinical Instructor in Medicine*
MARY LOUISE ROBBINS, Ph.D., *Professor of Bacteriology*
ROBERT HOOD ROBERTSON, M.D., *Clinical Instructor in Neurology*
LOUIS ROBINSON, A.B., *Lecturer in Journalism*
FLOYD STERLING ROGERS, B.S., M.D., *Associate in Obstetrics and Gynecology*
GRETCHEN LOUISA ROGERS, Ph.D., *Professor of German*
RICHARD ALLAN ROGERS, B.S., M.D., *Clinical Instructor in Psychiatry*
DERRILL CONWAY ROHLFS, B.E.E., *Lecturer in Electrical Engineering*
AUSTIN BERTRAM ROHRBAUGH, JR., A.B., M.D., *Clinical Instructor in Orthopedic Surgery*
RUFUS MARTIN ROLL, A.B., M.D., *Associate in Obstetrics and Gynecology*
MONROE JAMES ROMANSKY, A.B., M.D., *Professor of Medicine*
WALTER JOSEPH ROMEJKO, B.S., M.D., *Associate in Ophthalmology*
BLAKE SMITH ROOT, A.M., Ed.D., *Professor of Education; Assistant Dean of the School of Education*
MORTON HAROLD ROSE, M.D., *Associate in Medicine*

* On leave of absence 1960-61.

- PAUL ARCHIBALD ROSE, LL.B., *Associate Professorial Lecturer in Law*
ARTHUR ROSENBAUM, B.S., M.D., *Assistant Clinical Professor of Medicine*
MORRIS HIRSH ROSENBERG, A.B., M.D., *Assistant Clinical Professor of Medicine*
JACOB ROSENSWEIG, B.S., M.D., C.M., *Instructor in Surgery*
LOUIS ROSS, M.D., *Associate in Medicine*
ANTHONY LOUIS ROTOLO, B.S. in Ed., A.M., *Lecturer in Speech*
LOUIS SAMUEL ROTOLO, B.S. in E.E., *Lecturer in Electrical Engineering*
IRWIN WINN ROVNER, A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*
NORMAN HARTLEY RUBENSTEIN, M.D., *Associate in Medicine*
LEWELLYN ADAM RUBIN, M.S. in E.E., *Assistant Professor of Electrical Engineering*
MARSHALL DEGRAFFENRIED RUFFIN, B.S., M.D., *Associate Clinical Professor of Psychiatry*
JOSEPH YOUNG RUTH, A.B., *Director of Admissions*
JOSEPH AZIZ SABRI, A.B., M.D., *Associate in Otolaryngology*
HAROLD CHARLES SADIN, A.B., M.D., *Clinical Instructor in Medicine*
JOHN HARMER SAGER, A.B., M.D., *Clinical Instructor in Surgery*
WILLIAM FREDERICK SAGER, Ph.D., *Professor of Chemistry*
CAROL RUTH ST. CYR, Ph.D., *Associate Professor of Education*
ZACK WITTEN SANDERS, A.B., M.D., *Clinical Instructor in Neurology*
MELVIN WESLEY SANDMEYER, JR., A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*
GENNARO ANTHONY SANTANGELO, A.M., *Assistant Professor of English*
THOMAS STONE SAPPINGTON, A.B., M.D., *Assistant Clinical Professor of Medicine*
ROBERT IRVING SARBACHER, Sc.D., E.E., *Professorial Lecturer in Engineering Administration*
MARY KATHERINE LAURENCE SARTWELL, A.B., M.D., *Associate in Pediatrics*
WILLIAM WILFRED SAUNDERS, B.S., M.D., *Assistant Professor of Radiology*
CHARLES JOSEPH SAVARESE, JR., A.B., M.D., *Clinical Instructor in Medicine*
PETER HANS SAWITZ, M.S. in E.E., *Lecturer in Electrical Engineering*
RICHARD SCHAEINGOLD, B.S., M.D., *Assistant Clinical Professor of Psychiatry*

- LESLIE SCHAFER, M.B., Ch.B., *Clinical Instructor in Psychiatry*
WILLIAM JOHN SCHEWE, A.B., M.D., *Associate in Medicine*
ROSS PELTON SCHLABACH, JR., M.S., *Professor of Journalism*
RICHARD HAROLD SCHLAGEL, Ph.D., *Assistant Professor of Philosophy*
WILLIAM EDWARD SCHMIDT, Ph.D., *Associate Professor of Chemistry*
*WILSON EMERSON SCHMIDT, Ph.D., *Professor of Economics*
CYRIL AUGUSTUS SCHULMAN, B.S., M.D., *Associate in Medicine*
JOHN DUNCAN SCHULTZ, A.B., M.D., *Clinical Professor of Psychiatry*
MAXINE ANN SCHURTER, A.B., M.D., *Associate in Surgery*
IRVIN SAMUEL SCHWARTZ, A.M., *Professorial Lecturer in Public Administration*
SAMUEL MEYER SCHWARTZ, Ph.D., *Associate Professor of Pharmaceutical Chemistry*
AARON BEAR SEIDMAN, A.M., RABBI, *Lecturer in Religion*
ALVIN SELTZER, B.S., M.D., *Associate in Medicine*
EUGENE SERGEI SEREBRENNIKOV, B.S. in Agr., *Lecturer in Russian*
FELIX IRA SHAFFNER, Ph.D., *Professorial Lecturer in Business Administration*
HYMAN DAVID SHAPIRO, M.D., *Clinical Professor of Neurology*
DAVID JAMES SHARPE, A.B., LL.B., *Assistant Professor of Law*
GEORGE SHARPE, A.B., M.D., *Clinical Instructor in Medicine*
SAMUEL HAZEN SHEA, A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*
GEORGE WALTER SHELHORSE, LL.B., *Lecturer in Law*
†ERNEST SEWALL SHEPARD, A.M., *Professor of English Literature*
ERNEST ALFRED WATSON SHEPPARD, M.D., C.M., *Clinical Professor of Ophthalmology*
MAX GIMBLE SHERER, M.S., M.D., *Clinical Instructor in Medicine*
JOSEPH LEE SHERIDAN, A.B., M.D., *Clinical Instructor in Psychiatry*
MILDRED HOLLANDER SHOTT, A.M., *Associate Professor of Secretarial Studies*
GERALD IRWIN SHUGOLL, B.S., M.D., *Clinical Instructor in Medicine*
JASSALEE SICKMAN, A.B., *Studio Lecturer in Art (Painting)*
ROBERT SUMNER SIGAFOOS, Ph.D., *Associate Professorial Lecturer on Plant Ecology*
HAROLD MARTIN SILVER, A.B., M.D., *Associate in Medicine*

* On leave of absence fall semester 1960-61.

† On sabbatical leave fall semester 1960-61.

- MAURICE ARTHUR SISLEN, A.B., M.D., *Clinical Instructor in Medicine*
 JAMES GLOVER SITES, M.D., *Assistant Professor of Obstetrics and Gynecology*
 IRENE I-LIEN HSU SIU, B.S., M.D., *Assistant Professor of Medicine*
 JOSEPH RICHARD SIZOO, A.M., D.D., Litt.D., LL.D., L.H.D., S.T.D.,
Milbank Professor of Religion; Director of University Chapel
 DUDLEY GRAHAM SKINKER, LL.B., *Associate Clerk of the Trial Practice Court*
 JOHN WILLIAM SKINNER, Ph.D., *Associate Professor of Economics*
 LEWIS SLACK, Ph.D., *Professor of Physics*
 CHARLES HENRY SLAYMAN, JR., LL.B., *Lecturer in Political Science*
 BENJAMIN WILLIAMS SMITH, Ph.D., *Associate Professor of Biochemistry*
 JOHN ELDRID SMITH, A.B., M.D., *Assistant Clinical Professor of Medicine*
 LYMAN BRADFORD SMITH, Ph.D., *Professorial Lecturer on Plant Taxonomy*
 PAUL KENNETH SMITH, Ph.D., *Professor of Pharmacology*
 RALPH GRAFTON SMITH, M.D., Ph.D., *Clinical Professor of Pharmacology*
 ROBERT ROLAND SMITH, B.S., M.D., *Clinical Instructor in Surgery*
 SCOTT WINFIELD SMITH, Ph.D., *Associate in Radiology*
 WILLIAM ARTHUR SMITH, A.M., *Assistant Professor of Mathematics*
 NICHOLAS PATRICK DILLON SMYTH, M.S., M.B., Ch.B., *Assistant Professor of Surgery*
 JEANNE ELLEN SNODGRASS, A.B., M.S. in P.E., *Assistant Professor of Physical Education for Women*
 LUTHER HENRY SNYDER, A.B., M.D., *Associate in Medicine*
 ISRAEL GREGORY SOHN, A.M., *Associate Professorial Lecturer in Geology*
 HENRY SOLOMON, A.M., *Lecturer in Economics*
 WALDO SOMMERS, Ph.D., *Associate Professor of Public Administration*
 PETER SOYSTER, M.D., *Clinical Instructor in Obstetrics and Gynecology*
 WILLIAM SPENCER, A.M., *Lecturer in Political Science*
 GEORGE WARREN SPREHN, M.D., *Clinical Instructor in Psychiatry*
 PAUL HAROLD STACY, A.M., *Assistant Professor of English*
 LORETTA MAY STALLINGS, A.M., *Associate Professor of Physical Education for Women; Director of Women's Athletics*
 WILLIAM WOODROW STANBRO, M.D., *Professor of Radiology*

- TIMOTHY WADSWORTH STANLEY, A.B., LL.B., *Lecturer in Political Science*
- WILLIAM STARK, A.B., M.D., *Associate in Pediatric Psychiatry*
- IRA ERNEST STEELE, A.M., *Professorial Lecturer in Accounting*
- PAUL CURRY STEELE, M.F.A., *Assistant Professor of English Composition*
- RICHARD WALTON STEPHENS, Ph.D., *Associate Professor of Sociology and Anthropology*
- EDWIN LOCKWOOD STEVENS, A.M., *Associate Professor of Speech*
- HAROLD STEVENS, Ph.D., M.D., *Professor of Neurology*
- RUSSELL BRADFORD STEVENS, Ph.D., *Professor of Botany*
- NATHANIEL STEWART, M.S., Ed.D., *Professorial Lecturer in Engineering Administration*
- THOMAS DALE STEWART, A.B., M.D., *Professorial Lecturer in Anatomy*
- CHARLES FREDERICK STIEGLER, A.B., M.D., *Associate in Pediatrics*
- HOWARD LIVINGSTON STIER, Ph.D., *Professorial Lecturer in Statistics (Engineering Administration Program)*
- LOUIS RAY STOCKSTILL, A.B., *Lecturer in Journalism*
- MYER HAROLD STOLAR, B.S., M.D., *Assistant Clinical Professor of Medicine*
- WILLIAM LEETE STONE, A.B., M.D., *Associate in Medicine*
- JOSEPH NOVAK STONESIFER, A.M., *Professorial Lecturer in Business Administration*
- KARL ERNEST STROMSEM, Ph.D., *Professorial Lecturer in Public Administration*
- FRED WOHLWEND STUART, *Lecturer in Speech*
- DONALD HARRISON STUBBS, A.M., M.D., *Clinical Professor of Anesthesiology*
- JAMES WHITLEY SUBER, A.M., Ed.D., *Lecturer in Education*
- SAMUEL JACOB NATHAN SUGAR, Phar.G., M.D., *Assistant Clinical Professor of Medicine*
- BENJAMIN HARDY SULLIVAN, JR., A.B., M.D., *Assistant Clinical Professor of Medicine*
- *RAFAEL SUPERVÍA, Doctor en derecho, *Associate Professor of Spanish*
- EDITH SHORES SURREY, A.M., *Lecturer in Speech*
- ALVIN RANDOLPH SWEENEY, JR., A.B., M.D., *Associate in Medicine*
- JAMES GERARD SWEENEY, A.M., *Assistant Professor of English*
- LEON SWELL, Ph.D., *Associate Professorial Lecturer on Lipids*

* On sabbatical leave fall semester 1960-61.

- STANLEY JEROME TALPERS, A.B., M.D., *Clinical Instructor in Medicine*
IRENE GORSKI TAMAGNA, M.D., *Assistant Clinical Professor of Medicine*
JOSEPH TANEY, *Studio Lecturer in Art (Commercial Art)*
NELSON MONROE TART, B.S., M.D., *Clinical Instructor in Obstetrics and Gynecology*
NORMAN TAUB, B.S., M.D., *Associate Clinical Professor of Psychiatry*
ROBERT GEORGE TAYLOR, M.D., *Associate in Medicine*
GEZA TELEKI, Ph.D., *Professor of Geology*
IRA ROCKWOOD TELFORD, Ph.D., *Professor of Anatomy*
RALPH JASON TEMPLE, B.B.A., LL.B., *Assistant Professor of Law*
SARAH SHTOFFER TENENBLATT, A.B., M.D., *Assistant Clinical Professor of Psychiatry*
JOHN NEWELL TEVIS, A.M., *Lecturer in Physics*
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THE ELECTRONICS RESEARCH PROJECT

The Electronics Research Project does work in the general field of Nucleonics, the improvement of the operations of photomultiplier tubes, and the development of fast operating coincidence measurements, flip-flop circuits, and pulse generators. This project operates under contracts with the Department of the Navy.

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The purpose of the Logistics Research Project is to study Logistics problems in all their aspects, to develop more efficient and expeditious methods of solving Logistics problems, and the application of computing machine techniques to the solution of these problems. As part of this study a large collection of operating data is being classified and coded for statistical study using modern machine methods. This project is operated under a contract with the Department of the Navy.

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The Human Resources Research Office was established by means of a contract between the Department of the Army and The George Washington University to carry out an integrated Army program of human resources research. The work is conducted mainly in the fields of training methods and motivation, morale, and leadership. A research division and supporting services including a statistical office are located on the University campus. Five research units work under the command of Headquarters, Continental Army Command, and the technical supervision of the Washington Office. At present they are situated at Fort Knox, Kentucky; Presidio of Monterey, California; Fort Benning, Georgia; Fort Bliss, Texas, and Fort Rucker, Alabama.

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ARMY LOGISTICS RESEARCH PROJECT

The Army Logistics Research Project is engaged in a program leading to the development and strengthening of logistics theory and the application of such theory to practice.

Relationships important to managerial decision-making are stressed. The research extends to systems design, analysis of systems performance, and the testing of methodology to meet logistical operating criteria of the present and for the Army of the future.

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James Jacob Yavecchia, *Manager of the Medical Book Store*
Winifred Elizabeth Robinson, *Chief Telephone Operator*
Dilla Wright, *Telephone Operator*
George Milton Becker, *Stage Manager of Lisner Auditorium*

TECHNICAL ASSISTANTS IN SCIENCE DEPARTMENTS

Rudolph Bailey, *Stockroom Clerk in Chemistry*
Joan Beatrice Bernheimer, *Technician in Bacteriology*
Fred Buttner, *Technician in Physiology*
James Francis Delaney, Jr., *Photographer in Medical School Photographic Laboratory*
John Henry Hann, *Stockroom Clerk in Chemistry*
Dorothy Harris, *Technician in Medicine*
Kenneth Kevin Kelly, *Technician in Biochemistry*
Peter Antel Pasztory, *Technician in Pathology*
Jno Deshon Randall, *Technician in Neurology and Neurological Surgery*
Rotraut Elisabeth Spangler, *Technical Assistant in Bacteriology*
Benito Ethelson Springer, *Stockroom Clerk in Pharmacy*
Caroline Amelia Woodruff, M.S., *Technician in Anatomy*
Wallace Mason Yater, Jr., *Technician in Physics*

OFFICE OF THE DIRECTOR OF ADMISSIONS

Margaret LeStourgeon Tymeson, A.B., *Assistant to the Director of Admissions*
Sarah Jane Steele, *Secretary to the Director of Admissions*
Jessie Fair Persun, *Evaluator*

Shirley Howerth Richards, A.B., *Evaluator*
Dorothy Tomlin, A.M., *Admissions Adviser*
Jean Wilson McGovern, A.M., *Evaluator*
Elizabeth Grafton Boyd, B.S., *Evaluator*
Scott Magruder Eldridge, A.B., *Evaluator*
Frances Frost Abbott, A.B., *Evaluator*
Dorothy Elizabeth Bonk, *Evaluator*
Mary MacLeod Addy, B.S., *Admissions Assistant*
Roberta Iris Feldman, A.B., *Evaluator*
Mary Fern Elliott, *Clerk-Typist*
Clara Laitner Crowl, *Clerk-Typist*
Peggy Ann Pillow, *Clerk-Typist*
Virginia Lising Manalo, B.S. in Ed., *Clerk*
Aida Burela, *Typist*

OFFICE OF THE REGISTRAR

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Virginia Rose Schmidt, *Assistant to the Registrar*
Beatrice Dickens, A.B., *Assistant to the Registrar*
Sonia Fay Seaton, *Secretary to the Registrar*
Mildred Van Horn Lee, *Statistical Clerk*
Mary Fung-Gee Moy Mino, *Statistical Clerk*
Doris Ann Johnson, A.B., *Transcript Clerk*
Joy Annette Lathers, *Transcript Clerk*
Isabel Robinson Bilisoly, A.B., *Graduation Clerk*
Thomas Francis Talentino, *Graduation Clerk*
Doris Weber Barton, B.S., *Balance Sheet Clerk*
Gertrude Garner Hurlbut, A.M., *Record Clerk*
Linda Webster, *Record Clerk*
Frances Kite Coons, *Record Clerk*
Constance Woodward Warner, *Record Clerk*
Eleanor Johnson, *File Clerk*
Irene Correia, *Receptionist*

THE LIBRARY

Samuel Theodore Waters, A.B., M.S. in L.S., *Associate Librarian*
Anna Virginia Appich, A.B., *Assistant Librarian, Acquisitions*
Mary Elizabeth Thompson, B.S., B.S. in L.S., *Assistant Librarian, Cataloguing*
Isabella Frances Young, A.B. in L.S., *Assistant Librarian, Medical Library*
Bertha Margarethe Rothe, A.M., B.S. in L.S., LL.B., LL.M., *Assistant Librarian, Law Library*
Joanne Monk, A.M., *Assistant Librarian, Reference*
Alice Pollock Bray, B.S., B.S. in L.S., *Assistant, Cataloguing*

Doris Anna Carpenter, A.B., *Assistant, Law Library*
Edith Audrey Gaylord, A.B., *Assistant, Periodicals*
Betty Mace Hedrick, A.B. in Govt., LL.B., *Assistant, Law Library*
Betty Jenkins Heller, M.S., *Assistant, Acquisitions*
Somanahally Malliah Krishna, A.B., LL.B., M.C.L., *Assistant, Law Library*
Mercy Stoner McCurdy, *Assistant, Periodicals*
Margaret Laramy Meaker, A.M., B.S. in L.S., *Assistant, Circulation*
Edith Sewall Phillips, A.B., *Assistant, Cataloguing*
Alice Sheftel, B.S., *Assistant, Acquisitions*
DeElma Clare Smith, A.B., *Assistant, Reserve Book Reading Room*
Joan Crisp, *Assistant, Medical Library*
Priscilla Davis Webber, A.B., *Assistant, Law Library*
Hidemi Fumino, A.B., *Assistant, Medical Library*
Susan Deborah Gould, *Assistant, Acquisitions*
Joan Spofford Hulfish, *Assistant, Cataloguing*
Charleene Lightsey Jones, B.S., *Assistant, Acquisitions*
Norma Polizzi Sims, B.S., *Assistant, Circulation*
Linn Fuller Wood, *Assistant, Hospital Library*

OFFICE OF UNIVERSITY DEVELOPMENT

OFFICE OF THE ASSISTANT TO THE PRESIDENT

Marvin Topping, A.B., S.T.B., *Assistant Director of the University Development Division*
Curtis Lewis, *Secretary*
Rachel Tims Parker, A.B., *Secretary to the Assistant Director of the University Development Division*
Anne Terrell Broadus, *Secretary*

EDUCATIONAL COUNSELING OFFICE

Timothy Edward Smith, A.M., *Educational Counselor*
William Leonard Fournier, A.M., *Educational Counselor*
Nancy Hastings House, *Assistant to the Educational Counselors*
Colette Pifueres Greenwood, A.B., *Assistant*

PUBLIC RELATIONS OFFICE

Merle Ellsworth Dowd, A.B., *Director of Public Relations*
Mary Margaret Davis, A.M., *Associate Director of Public Relations*
Lillian Brooks Brown, *Director of Radio and Television*
John Samuel Toomey, A.B., *Assistant Director of Public Relations*
Jane Tunstall Lingo, A.B., *Staff Writer*
James Douglas Ward, *Public Relations Assistant in Charge of Sports Publicity*
Miriam Sara Butwin, A.B., *Assistant in Radio and Television*
Shandren Campbell Moore Bellizzi, *Secretary*

ALUMNI OFFICE

Stanley Tracy, LL.B., *Alumni Secretary*
 Adrienne Barker Kar, *Administrative Assistant*
 John Seward Phillips, *Alumni Fund Clerk*
 Suha Saleba, A.B., *Record Clerk*
 Ross Hudelson, A.B., *Secretary*
 Nicholas Vartzikos, B.S., *Addressograph Operator*

OFFICE OF THE DEAN FOR SPONSORED RESEARCH

Susan Finnell Hart, *Assistant to the Dean*
 Joseph Donald McLaughlin, LL.B., *Assistant to the Dean*
 Louise Wilson Watts, *Secretary*

OFFICE OF THE PATENT, TRADE-MARK, AND COPYRIGHT
 FOUNDATION

Louis James Harris, A.B., LL.B., S.J.D., LL.M., *Executive Director*
 Robert Edward Grindle, *Editorial Assistant*
 June Whiting Loker, B.F.A., *Editorial Assistant*
 Fredrica Foster Hodges, A.B., *Assistant Secretary*
 Marion Barbara Marshall, A.B., *Assistant Secretary*

STUDENT ACTIVITIES

Jacqueline Isabel Olsen, M.S. in Ed., *Assistant to the Director of Activities for Women*
 Deane Arlene McDonald, *Secretary, Office of the Director of Activities for Women*
 Edward Ferero, A.B. in Govt., *Housing Assistant in the Office of the Director of Activities for Men*
 Patricia Elizabeth Gussin, *Student Activities Assistant*

INTERCOLLEGIATE ATHLETICS

William Jennings Reinhart, B.B.A., *Head Baseball and Head Basketball Coach*
 William Thomas Elias, A.M., *Head Football Coach*
 Raymond George Hanken, B.S. in P.E., A.M. in Ed., *Assistant Football Coach*
 William Neal, A.M., *Assistant Football Coach*
 Elmer Vincent Scallish, A.M. in Ed., *Assistant Football Coach*
 Hayden Buckley, A.B., Ed.M., *Assistant Football Coach*
 George Klein, A.B. in Ed., *Assistant Basketball and Baseball Coach*
 Harry Ledford, *Athletic Trainer*
 Ardith Laurina Harding, *Secretary in the Department of Intercollegiate Athletics*

MUSICAL ACTIVITIES

Robert Howe Harmon, A.B., M.D., *Director of the Glee Clubs*
Grace Ruble Harmon, *Associate Director of the Glee Clubs*

VETERANS EDUCATION

Janet Wildman Johnson, A.M., *Assistant Director of Veterans Education*
Margaret Lamb, A.B., *Assistant to the Director of Veterans Education*
Kay Blythe Buchanan, *Receptionist and Chief Clerk*

THE READING CLINIC

Laura Furtado McCarty, A.M., *Assistant Director*
Grace Louise Toon, *Secretary*

UNIVERSITY HOSPITAL

Fred Augustus Menk, *Associate Administrator*
Francisco Paolo Ferraraccio, B.S., *Assistant Administrator*
John James Bordelon, A.B., *Administrative Assistant to the Administrator*
Madeline Lenora Brown, R.R.L., A.B., *Medical Record Librarian*
Margaret Emanuel, R.N., M.S., *Director of Nursing*
Sadie Estell Oakley, *Acting Chief, Admissions Department*
Thelma Moore, *Chief, Telephone Department*
Louise O'Neal, R.N., A.B., *Assistant Director of Nursing*
Raymond Francis Whitehair, *Administrative Assistant, Outpatient Department*
Francis William Santelli, *Executive Housekeeper*
Frank Leonard Sasher, *Manager, Laundry Department*
Joanne Louise Styer, B.S., *Chief Therapeutic Dietitian*
Robert Hamilton Thompson, B.S., *Director of Food Service*
Laura Beasley Brown, *Secretary, Office of the Medical Director*
Mary Bernadette Lansinger, *Secretary, Office of the Administrator*

RESIDENCE AND SORORITY HALLS

Mary Wright, *Resident Director, Hattie M. Strong Hall for Women*
Roxie La Preal Clapp Monson, *Assistant Resident Director, Hattie M. Strong Hall for Women*
Margie Russell Preston, *Resident Director, Dolly Madison Hall for Women*
Jane O'Roark Abbott, Mus.B., *Assistant Resident Director, Dolly Madison Hall for Women*
Robert Stauffer, *Resident Manager, John Quincy Adams Hall for Men*
James Riddle, A.B. in Govt., *Assistant Resident Manager, John Quincy Adams Hall for Men*
Henry Agusiewicz, *Housing Manager, Welling Hall*

HISTORY AND ORGANIZATION

HISTORY

The story of the University of California is a story of the struggle for the right to a free and open university. It is a story of the struggle for the right to a university that is not controlled by the state, but by the people. It is a story of the struggle for the right to a university that is not controlled by the state, but by the people.

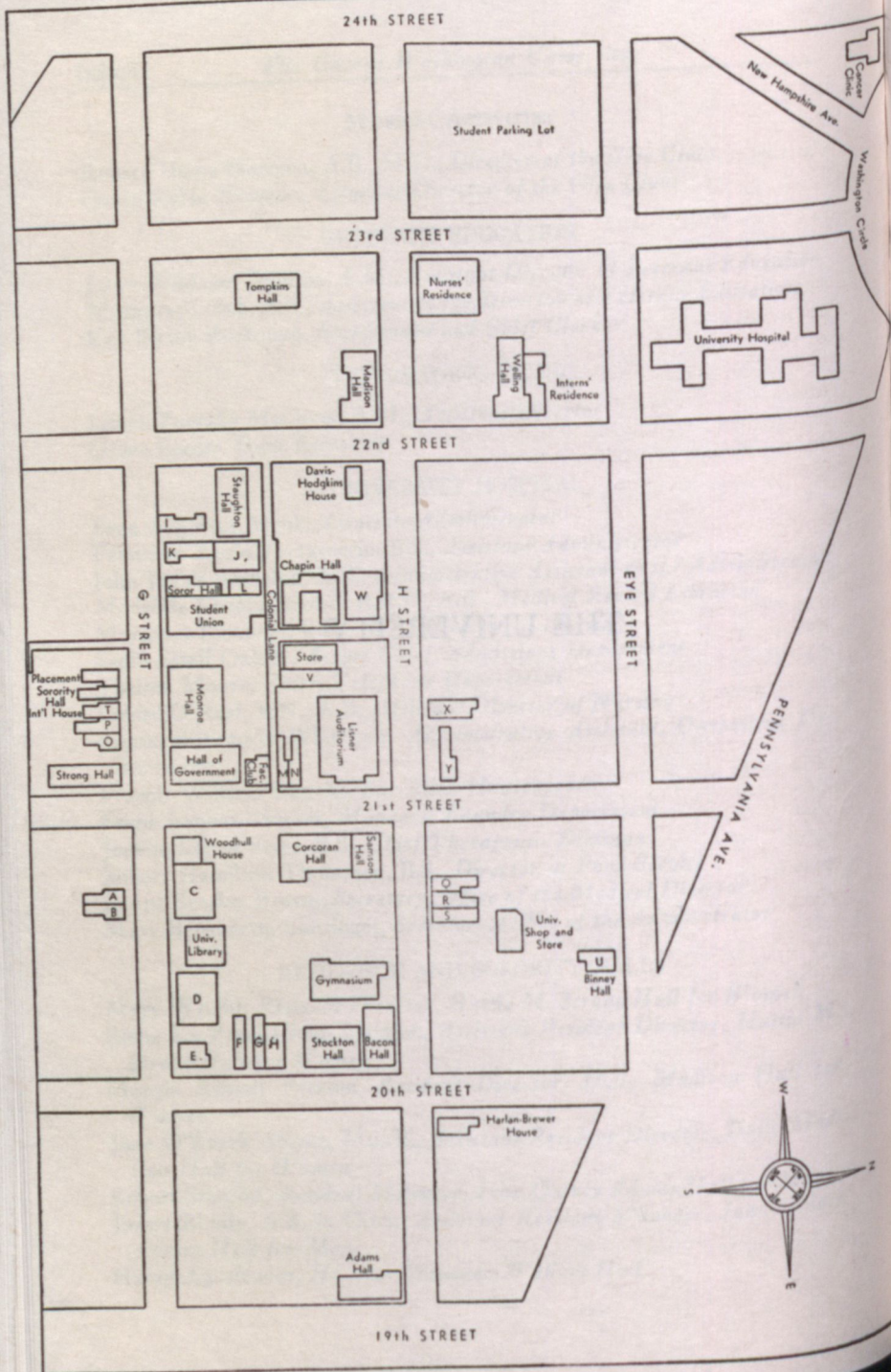
It was the struggle of the people of California to have a university that was not controlled by the state, but by the people. It was the struggle of the people of California to have a university that was not controlled by the state, but by the people.

THE UNIVERSITY

The University of California is a university that is not controlled by the state, but by the people. It is a university that is not controlled by the state, but by the people. It is a university that is not controlled by the state, but by the people.

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HISTORY AND ORGANIZATION

HISTORY

The idea of a university located in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government."

It was George Washington's hope that the "General Government" would extend toward such an institution "a fostering hand". No steps were taken by Congress to carry out the provisions of Washington's will, and the stock he had bequeathed for the establishment of a university in the District of Columbia became valueless owing to the failure of the Potomac Canal properties.

Meanwhile, however, a movement was started by private persons under the leadership of Luther Rice to establish an institution of higher learning at the seat of the National Government for the education of the Baptist ministry and to afford general collegiate training. In 1819 an association was formed by Luther Rice, Obadiah B. Brown, Spencer H. Cone, and Enoch Reynolds for the purpose of raising funds to buy land for the use of the college.

A group of the Nation's leaders who were especially interested in Washington's idea became patrons of the college and contributed to funds raised for the purchase of land and erection of buildings. Among them were James Monroe, President of the United States; William H. Crawford, Secretary of the Treasury; John C. Calhoun, Secretary of War; William Wirt, Attorney General; Return J. Meigs, Postmaster General; and thirty-two members of Congress.

Legally to implement the college a petition was made to Congress for the incorporation of "the General Convention of the Baptist Denomination in the District of Columbia for evangelical and literary purposes". This petition was denied by Congress, on April 26, 1820, because of its sectarian character.

Failing to obtain a denominational charter members of the association enlarged their objective to embrace national aims, and with the sponsorship of Government leaders there was presented in Congress a bill for the incorporation of "the Columbian Society for literary purposes", it being proposed to realize in this way "the aspirations of Washington,

Jefferson and Madison for the erection of a university at the seat of the federal government."

Acting upon this second petition, on February 9, 1821, Congress chartered Columbian College in the District of Columbia, inserting in the charter by special action the provision "that persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College or denied any of the privileges, immunities or advantages thereof, for or on account of his sentiments in matters of religion".

Thus Columbian College in the District of Columbia was chartered by Congress as one of the early nonsectarian institutions of higher learning in the United States, under the distinguished favor of President James Monroe and members of his Cabinet.

A tract of approximately forty-seven acres, extending about one-half mile northwest of Boundary Street (Florida Avenue) between Fourteenth and Fifteenth Streets, was purchased and by 1822 the main building was completed sufficiently to use.

Two years later, when the first Commencement was held on December 15, 1824, Congress and the Supreme Court adjourned their sessions to enable their members to attend the exercises. President Monroe, John Quincy Adams, John C. Calhoun, Henry Clay, and the Marquis de Lafayette headed the eminent company in attendance.

By an act of Congress of March 3, 1873, the name of the College was changed to "Columbian University", in recognition of the enlarged scope of the institution. In 1884 the University was moved from its first location on "College Hill", now Columbia Heights, to the new University Hall built for it at Fifteenth and H Streets. Near-by buildings accommodated the School of Medicine and somewhat later, the Law School.

For a period of six years, from 1898 to 1904, the University was placed under control of the Baptist Denomination. In 1904 an act restoring the original secular character of the University and authorizing change of name to The George Washington University was passed by Congress.

Subsequently all colleges, schools, and divisions of the University except the School of Medicine were brought together in the area bounded by Nineteenth, Twenty-third, and G Streets, and Pennsylvania Avenue NW. The School of Medicine is situated on H Street between Thirteenth and Fourteenth Streets NW.

The endowment of the University is \$7,500,000.

In 1930 a new plan of academic organization for the liberal arts work was effected in the establishment of the Junior College and the redefining of graduate work.

PURPOSE AND OBJECTIVES

The main purpose of The George Washington University may be briefly stated: to establish and maintain the high tradition of the University ideal in the political center of the Nation. In the words of the Bill of Incorporation, introduced and subsequently enacted by Congress, in 1821, it was proposed to realize "the aspirations of Washington, Jefferson, and Madison, for the erection of a university at the seat of the Federal Government." The idea of a university so situated was, in the minds of the early sponsors and patrons, to afford a relation between the traditional objectives of higher education, and, as Washington stated: "knowledge in the principles of Politics and good Government." This central idea of a University functioning in the Capital of the Nation, nonsectarian, free of sectional limitations, conscious of its wide American relationships, and open to the ever-increasing international influences which bear upon it, has been continuous through nearly a century and a half of difficult growth and adaptation.

The main, simple purpose of this University has been therefore, to develop the university ideal in the place of greatest national significance, flexible before the changing needs of its growing national constituency and loyal to the traditional principles of learning and research, in providing through disciplined reason, wisdom for the individual and his society. This statement intends to differentiate University objectives from the incorporation of the more specific objectives of the colleges and schools which comprise the University. Theirs is the problem of relating the university ideal to the particular application of scholarship and professional learning in their several fields.

THE COLLEGES, SCHOOLS, AND DIVISIONS

The George Washington University includes fourteen colleges, schools, and divisions, as follows:

The Junior College offers the work of the first two years of the four-year college program in the liberal arts and sciences and two years of preprofessional work. Each of these curricula leads to the degree of Associate in Arts. It also offers two-year terminal curricula. Those in Accounting and Secretarial Studies lead to the degree of Associate in Arts; those in Home Economics and Physical Sciences lead to the degree of Associate in Science.

Columbian College offers the work of the junior and senior years of the four-year college program in the liberal arts and sciences leading to the degrees of Bachelor of Arts and Bachelor of Science. In cooperation with the Department of Pathology and the University Hospital, Columbian College offers a course in Medical Technology leading to the degree of Bachelor of Science in Medical Technology. It also offers the studies

leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

The Graduate Council offers a program of advanced study and research leading to the degree of Doctor of Philosophy.

The School of Medicine offers work leading to the degree of Doctor of Medicine.

The Law School offers professional and graduate courses leading to the degrees of Bachelor of Laws, Juris Doctor, Master of Laws, Master of Comparative Law, and Doctor of Juridical Science.

The School of Engineering offers courses leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering, Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

The School of Pharmacy offers courses leading to the degrees of Bachelor of Science in Pharmacy and Master of Science in Pharmacy.

The School of Education offers undergraduate programs leading to the degrees of Bachelor of Arts in Education, Bachelor of Science in Home Economics, and Bachelor of Science in Physical Education, and graduate studies leading to the degrees of Master of Arts in Education and Doctor of Education.

The School of Government offers undergraduate programs of study in Foreign Affairs, Public Affairs, Accounting, Business Administration, Business and Economic Statistics, leading to the degree of Bachelor of Arts in Government. Graduate work is offered leading to the following degrees: Master of Arts in Government; Master of Arts in Public Administration; Master of Arts in Personnel Administration; Master of Business Administration; and Doctor of Business Administration.

The College of General Studies supplements the adult education program of the University through its Off-Campus Division, Campus Division, and Division of Community Services. This College offers programs leading to the degrees of Associate in Arts, Associate in Science, Bachelor of Arts, Bachelor of Science in Cartography, and Master of Arts in the fields of Controllershship, Governmental Administration, and Personnel Management.

The Division of University Students makes available courses for mature students, not candidates for degrees in this University.

The Division of Special Students makes available courses for students in the process of qualifying for degree candidacy.

The Division of Air Science offers a program of Air Force ROTC training which is integrated with the curricula of the colleges and schools of the University and leads to appointment as a commissioned officer in the United States Air Force Reserve.

The Summer Sessions.

INSTRUCTIONAL DIVISIONS

The instructional divisions, established at The George Washington University in 1930, are organized on the basis of the relationship of course content, interrelation of methods and prerequisites, and similarity of background and viewpoint. Originally there were four divisions, Languages and Literatures, Mathematics and Physical Sciences, Natural Sciences, and Social Sciences. The plan is being restudied and a provisional alignment has been made which adds two new divisions, Applied Sciences and Medical Sciences.

ADMINISTRATIVE AND RESEARCH ACTIVITIES

ADMINISTRATIVE UNITS

The University maintains the following Administrative Units: Health Administration, Veterans Education, the Reading Clinic, the Speech Clinic, and the Testing and Counseling Center.

RESEARCH PROJECTS

Research projects sponsored by agencies of the Federal Government and by private foundations and industries are conducted. Cooperation between these projects and the various departments of instruction is as close as the nature and needs of the projects and departments will permit.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association. The School of Medicine is a member of the Association of American Medical Colleges and is one of the medical colleges which have been continuously approved by the American Medical Association. The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. It is a member of the American Association of Colleges of Pharmacy. The School of Engineering is on the accredited list of the Engineers' Council for Professional Development. The School of Education is a charter member of the American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education.

LOCATION

The George Washington University is in downtown Washington four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible to the University are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor, as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

GOVERNMENT

The government and general educational management of The George Washington University are vested in a self-perpetuating Board of Trustees, with the President of the University as a member *ex officio*. The members of the Board are named for a period of three years and are divided into three classes. The members of one class are elected at each annual meeting to fill the places of the members whose terms of office expire. Two members of each class are nominated by the Alumni Association.

EDUCATIONAL FACILITIES

BUILDINGS

Buildings, grounds, and equipment are valued at approximately \$24,000,000.

The buildings of the Junior College, Columbian College, the Graduate Council, the Law School, the School of Engineering, the School of Pharmacy, the School of Education, the School of Government, the College of General Studies, the Division of University Students, the Division of Special Students, the Division of Air Science, the University Hospital and Outpatient Department, and the Cancer Clinic are located between Nineteenth and Twenty-fourth Streets and between Pennsylvania Avenue and G Street NW. The School of Medicine is at Fourteenth and H Streets NW. The buildings of the University are as follows:

- John Quincy Adams Hall, 730 Nineteenth Street. Residence hall for men.
- Bacon Hall, 2000 H Street. Named in honor of the late Joel Smith Bacon, President of the University from 1843 to 1854. Offices of the Dean of the Graduate Council, the Dean for Sponsored Research, the Assistant to the President, the Development Division, the Army Logistics Research Project, the Educational Counselor; offices and lounge for the Law Faculty; the Alumni Office; reception rooms for returning alumni.
- Binney Hall, 2018 I Street. Named in honor of the late Joseph Getchell Binney, President of the University from 1855 to 1858. Offices, classrooms, and laboratories of the Reading Clinic.
- Chapin Hall, 2128 H Street (rear). Named in honor of the late Stephen Chapin, President of the University from 1828 to 1841. Offices and classrooms of the Air Force ROTC.
- Corcoran Hall, 725 Twenty-first Street. Named in honor of the late William W. Corcoran, benefactor of the University and a former member of the Board of Trustees. Offices of the Treasurer, the departments of Chemistry and Physics; Chemistry Research Project; the chemistry and physics laboratories; classrooms.
- Davis-Hodgkins House, 731 Twenty-second Street. Offices and lounges of engineering students' organizations.
- Everglades Apartments, 2223 H Street. Residence hall for nurses.
- Faculty Club House, 714 Twenty-first Street.
- Gymnasium, 2010-12 H Street.
- Hall of Government, 710 Twenty-first Street. The gift of the late Mrs. Henry Alvah Strong, former Trustee of the University. Offices of the Dean of the School of Government, the departments of Accounting, Business and Public Administration, Economics, History, Political Science, and Statistics; Offices of the Air Force Advanced Management Course and Navy Graduate Comptroller-ship Program; classrooms.
- Harlan-Brewer House, 1923 H Street. Offices of law student organizations, lounges, reading rooms.
- Hospital House Staff Residence, 818 Twenty-second Street.
- Hospital and Outpatient Department, Washington Circle.
- International House, 2110 G Street. Office of the Adviser to Students from Foreign Countries; club rooms.
- Lisner Auditorium, 730 Twenty-first Street. The gift of the late Abram Lisner, former Trustee of the University. The Auditorium; Lisner Lounge; offices and classrooms of the Department of Speech, the Speech Clinic, and the housing officer; Athletic Ticket Office.

- Dolly Madison Hall, 736 Twenty-second Street. Residence hall for women.
- James Monroe Hall, 2115 G Street. Offices of the Dean of the Junior College, the Dean of Columbian College, the Dean of the Division of University Students, the Dean of the School of Education; the departments of Education, English (English and American Literature), Germanic Languages, Journalism, Mathematics, Psychology, and Secretarial Studies; classrooms.
- Office of the President, 2003 G Street. Offices of the President, Dean of Faculties, and Associate Dean of Faculties.
- Placement Office, 2114 G Street.
- Samson Hall, 2036 H Street. Named in honor of the late George Whitefield Samson, President of the University from 1859 to 1871. Comptroller's Office; Disbursing Office; offices of the departments of Chemistry, Geology, and Physics.
- School of Medicine, 1335-1339 H Street. Offices of the Dean and Staff of the School of Medicine; the Medical Library; laboratories; lecture rooms; research laboratories; student and faculty lounges; and University Medical Bookstore.
- Sorority Halls:
- 2129 G Street. Apartments of Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Zeta Tau Alpha, and Kappa Kappa Gamma sororities.
- 2131 G Street. Apartment of Delta Gamma Sorority.
- 802 Twenty-first Street. Apartment of Phi Sigma Sigma sorority.
- 2112 G Street. Apartments of Kappa Alpha Theta and Kappa Delta sororities.
- Staughton Hall, 707 Twenty-second Street. Named in honor of the late William Staughton, President of the University from 1821 to 1827. Offices and laboratories of the Navy Logistics Research Project.
- Stockton Hall, 720 Twentieth Street. Named in honor of the late Rear Admiral Charles Herbert Stockton, President of the University from 1910 to 1918. Law School; offices of the Dean of the National Law Center and the Dean and Faculty of the Law School, library, and lecture halls.
- Hattie M. Strong Hall, 620 Twenty-first Street. Named in honor of the donor, the late Mrs. Henry Alvah Strong, former Trustee of the University. Residence hall for women.
- Student Union, 2125 G Street. Offices of student organizations, student cafeteria and snack bar, reading room, lounge, game and music room, and the "Lost and Found" Office.
- Tompkins Hall of Engineering, 725 Twenty-third Street. The gift of the late Charles H. Tompkins, former Trustee of the University. Offices of the Dean of the School of Engineering; the departments of Civil, Electrical, Mechanical Engineering, and Engineering Administration; Electric Research Project, National Aeronautics Space Administration; Engineering testing laboratories, general laboratories, drafting rooms, and classrooms.
- University Book Store, 2120 H Street. University Medical Bookstore, 1335 H Street.
- University Library, 2023 G Street. The gift of the late Abram Lisner, former Trustee of the University. The library, rooms of the Board of Trustees, Office of the President Emeritus, Faculty Conference Room, classrooms.
- The Helen L. and Mary E. Warwick Memorial Building, 2300 K Street. Diagnostic and treatment rooms, and research laboratories of the George Washington University Cancer Clinic.
- Welling Hall, 814 Twenty-second Street. Named in honor of the late James Clarke Welling, President of the University from 1871 to 1894. Residence hall for men.
- Woodhull House, 2033 G Street. Gift of the late General Maxwell Van Zandt Woodhull, former Trustee of the University. Office of the Director of Activities for Women; meeting rooms for student activities.
- Building A, 2026 G Street. Offices of the Department of Romance Languages.
- Building B, 2024 G Street. Offices, laboratories, and classrooms of the Department of Home Economics.

- Building C, 2029 G Street. Offices of the Registrar and the Director of Admissions; offices and laboratories of the departments of Biology, Botany, Geology, and Zoology; language laboratories; classrooms.
- Building D, 2013 G Street. Office of the Business Manager; Human Resources Research Office.
- Building E, 2003 G Street. Offices of the President, Dean of Faculties, and Associate Dean of Faculties; office of the Department of Classical Languages.
- Building F, 706 Twentieth Street. Offices of the Dean of the College of General Studies.
- Building G, 712 Twentieth Street. Offices of the department of English (Composition section); Academic Editor.
- Building H, 714-16 Twentieth Street. Offices and locker rooms of the Department of Physical Education for Women.
- Building I, 2135 G Street. Offices, classrooms, and laboratories of the Department of Geography.
- Buildings J and L, 2131 and 2129 G Street (rear). Classrooms and locker rooms of the Department of Physical Education for Women.
- Buildings M and N, 716-18 Twenty-first Street. Offices of the departments of Philosophy and Slavic Languages; offices and laboratories of the Testing and Counseling Center.
- Building O, 2106 G Street. Office of the Department of Religion.
- Building P, 2108 G Street. Offices of the Student Health Service and the Dean of the Division of Special Students.
- Building Q, 2029 H Street. Office of the Director of Veterans Education, Plant Engineer, and the Director of Activities for Men.
- Building R, 2027 H Street. Offices of the Graduate Manager of Athletics, and the Athletic Staff.
- Building S, 2025 H Street. Offices of the Department of Physical Education for Men and Public Relations.
- Building T, 2110 G Street. Offices of the Dean of the Summer Sessions; International House (see International House).
- Building V, 2114 H Street. Research laboratories of the Department of Physics.
- Building W, 2128 H Street. Offices of the Dean and Faculty of the School of Pharmacy; pharmacy laboratories; classrooms.
- Building X, 2107 H Street. Offices of the departments of Art and Sociology and Anthropology; Patent, Trade-Mark, and Copyright Foundation; Population Research Project; Faculty offices.
- Building Y, 802 Twenty-first Street. Offices of the Department of Business and Public Administration; Small Business Administration.

LIBRARY FACILITIES

The Library collections of The George Washington University are housed in the University Library, the general library of the University; and in the departmental libraries of law, in Stockton Hall, and medicine, in the School of Medicine.

These collections contain approximately 342,000 volumes—265,600 in the University Library, 55,200 in the Law Library, and 21,200 in the Medical Library. Approximately 10,000 volumes a year are added to the library's resources. Endowments, supplementing the University appropriation, provide books in the fields of American civilization, American literature, foreign service, history, public finance, and the social sciences; and gifts from many sources have enriched the collections. The Libraries currently receive 1,800 periodicals.

In the modern University Library building, erected in 1939, on the first three floors are the delivery hall, card catalogue, reference and main reading rooms, periodical room, and reserve book rooms; on the fourth floor are ten planned seminar rooms. To the original 135,000 volume eight-tier stack of modern steel construction has been added a similar unit of 170,000 volume capacity with 50 study carrels.

Of the special subject collections in the University Libraries, the most recent acquisition is the internationally known library of the Carnegie Endowment for International Peace, which was assembled during forty years of its activity in Washington, and was purchased by the University. The collection contains 50,000 bound volumes and 20,000 pamphlets in the fields of international law and relations, history, and economics. Other collections in the Library are the W. Lloyd Wright collection of Washingtoniana, acquired in 1950; the Richard Heinzel Collection of Germanic philology and literature; the Curt Wachsmuth Collection of Greek and Roman literature, archaeology, and history; the Mount Vernon Collection on political history, international law, and the social sciences; a representative collection of Spanish American books, the gift of the governments of Hispanic America; and the Chauncey Mitchell Depew Public Speaking Collection.

Information concerning the use of the Libraries may be obtained at the Library service desks. A classified list on cards of selected recent acquisitions is available at frequent intervals, in addition to the complete information in the card catalogue. Monthly art exhibits are held on the first and second floors of the University Library during the academic year.

The hours of the University Library and the Law Library are Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.; Sunday, 2:00 to 6:00 P.M. The Medical Library is open Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.

The Library is administered for the curricular, reference, and recreational needs and interests of the students. Instruction in the use of the library is given in the required English courses, and by the reference librarians. The Library endeavors to assist students and all members of the University to use the rich library resources of Washington and the unusual opportunities they offer for extensive research. Interlibrary loan arrangements are maintained with other libraries in the city and in the United States.

The student has access to the Library of Congress, the Public Library of the District of Columbia and its branches, the library of the Pan American Union, the Library of the Bureau of Railway Economics, the Library of the United States Department of Agriculture, the Library of the United States Office of Education, the National Library of Medicine, the Library of the Smithsonian Institution, and many of the other great special collections of the government departments.

ADMISSION

All colleges, schools, and divisions of the University accept men and women.

Qualified students may be admitted to any college, school, or division of the University, except the School of Medicine, at the beginning of either semester or any of the Summer Sessions.

Entrance to the School of Medicine in 1960-61 is permitted only at the opening of the semester beginning September 1960.

The University reserves the right to refuse admission to any student who has a previous academic record of such grade as to create doubt of his ability to pursue college work successfully or who, for any other reason, would not be an acceptable student.

APPLICATION FOR ADMISSION

An applicant for admission must obtain from the Office of the Director of Admissions an application blank which he must fill out completely and return with the application fee of \$10 if applying as a degree candidate, \$5 if applying as a nondegree candidate. Each degree candidate must submit a recent photograph, signed by the applicant, with the application form.

Applications should be filed by July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions.

An applicant from a secondary school must send the high school record form provided by the University to his high school principal with the request that the principal fill out the form and mail it directly to the Office of the Director of Admissions.

An applicant who has previously attended an institution of higher learning must request the registrar of that institution to mail directly to the Office of the Director of Admissions a transcript of his record. If he has attended more than one such institution he must request the registrar of each institution to send to the Office of the Director of Admissions a transcript of his record, even though credits were not earned, together with an honorable dismissal from the institution last attended.

The Graduate Record Examination administered by the Educational Testing Service, Princeton, New Jersey, is accepted as supplemental evidence of the educational attainments of the applicant for graduate study, and the appropriate report should accompany the application for admission to graduate degree candidacy whenever available.

TEST INFORMATION

The requirement of tests for Junior College and School of Engineering applicants coming directly from secondary schools is specified in the entrance statement of these respective divisions.

Arrangement for tests is the responsibility of the applicant and should be made with the College Entrance Examination Board, 20 Nassau Street, Princeton, New Jersey, not less than one month before the date of the test. The Bulletin of Information, obtainable without charge from the College Entrance Examination Board, contains descriptions of the tests as well as rules regarding applications, fees, reports, and the conduct of the tests; lists of examination centers; and an application blank. On the application for the test, the student should specify that the scores be sent to the Director of Admissions, The George Washington University, Washington 6, D. C.

College Entrance Board tests are given at a large number of examination centers throughout the United States, including Washington, D. C., on the following dates:

Scholastic Aptitude Test.—January 9, February 6, March 12, May 21, August 10, and December 3, 1960; January 14, February 4, March 18, May 20, and August 9, 1961.

Achievement Tests.—March 12, May 21, August 10, and December 3, 1960; March 18, May 20, and August 9, 1961.

In special circumstances, the Committee on Admission and Advanced Standing may prescribe other appropriate tests. Necessary instructions will be sent to the applicant by the Director of Admissions.

CREDIT FROM HIGHER INSTITUTIONS

An applicant for advanced standing may be considered for admission upon the presentation of satisfactory credentials from an accredited institution of higher learning. The student must be in good standing as to scholarship and conduct, and must be eligible to return to the previously attended institution in the semester for which he seeks admission to this University.

If the transcript of record from such an institution includes the record of his secondary school work, it is not necessary for the applicant to have forwarded a separate record directly from the principal of the secondary school.

Properly certified courses taken at accredited colleges or universities may be applied toward a degree at this University, subject to the curriculum requirements and regulations of the school or college to which admission is sought. Work of low pass grade (such as *D* or the equivalent) will not be considered for transfer.

The University reserves the right to refuse credit for transfer in whole or in part, or to allow it provisionally. Credit so given may be withdrawn for subsequent poor work.

METHODS OF READMISSION

A student who has previously registered in the University, but who has not been in attendance during the semester prior to registration (summer session excluded) must file an application for readmission in advance of registration. If the student is seeking readmission as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must file in the Office of the Director of Admissions complete and official transcripts of record from each institution attended before his application may be considered. All applications for readmission are considered on the basis of regulations effective for the specific semester in which the applicant seeks to enter.

TRANSFER WITHIN THE UNIVERSITY

For information concerning transfer from one college, school, or division to another within the University, see pages 54-55.

ENTRANCE REQUIREMENTS *

The applicant for undergraduate or graduate work must be of good character and must have an academic background appropriate for the program of studies contemplated.

THE JUNIOR COLLEGE

Consideration for admission is based upon the combined evidence of the following factors:

1. An acceptable certificate of graduation from an accredited secondary school, showing a minimum of fifteen "units"[†]
2. The principal's statement that the applicant is adequately prepared to undertake college work with reasonable prospect of success
3. Scores on the Scholastic Aptitude Test of the College Entrance Examination Board.

Applicants from secondary schools should refer to pages 13-14 for Test Information concerning the time, place, and directions for the required Scholastic Aptitude Test.

The Committee on Admission and Advanced Standing will consider the adequacy of the qualifications for academic success of an applicant who, because of unusual circumstances, does not present all the formal requirements stated above. The Committee may prescribe appropriate tests as necessary.

Distribution of Units for All Curricula.—Certification by the principal

* Entrance requirements are established by the faculties of the several colleges, schools, and divisions. The Director of Admissions, as agent for the faculties, administers regulations governing admission, readmission, and transfer.

[†] A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

that the student has satisfied all curriculum requirements of the school will be accepted in lieu of any prescribed distribution of units. Attention is called, however, to the necessity of completing stated prerequisite studies during the secondary school period for admission to certain curricula. It is to be noted that one unit of algebra is prerequisite to courses in chemistry, mathematics, physics, and statistics, and that in addition one unit of plane geometry is prerequisite to courses in mathematics and physics. In the instance of applicants who do not meet the above stated mathematics requirements, algebra and plane geometry may be taken without college credit when offered by the Department of Mathematics. For a statement of the foreign language requirements see pages 68-69.

A desirable secondary school program in preparation for college would include: four years of English, at least two years of one foreign language, two years of natural or physical science with laboratory instruction (over and beyond the so-called "General Sciences"), two or three years of social studies (with concentration on history), one or two years of basic mathematics.

COLUMBIAN COLLEGE (THE SENIOR COLLEGE)

For the Bachelor's Degrees

Two years of Junior College work leading to the degree of Associate in Arts, or the lower-division work in institutions not organized on the junior-senior-college plan, following a specified curriculum, meet the minimum requirements of Columbian College.

Bachelor of Arts.—An Associate in Arts degree based on the *Arts and Letters* curriculum in the Junior College, or the equivalent (see page 69), is required.

Bachelor of Science.—An Associate in Arts degree based on the *Science* curriculum in the Junior College, or the equivalent (see page 70) is required.

Bachelor of Science in Medical Technology.—An Associate in Arts degree based on the *Science* curriculum in the Junior College, including Chemistry 11-12, Zoology 1-2, and Bacteriology 112, or the equivalent (see pages 70-71), is required.

For the Master's Degrees

An approved Bachelor's degree from an accredited higher institution is required. A student from an unaccredited institution may be admitted at the discretion of the Committee on Admission and Advanced Standing, but he will be required to take such extra work above the minimum requirements as may be prescribed. An appropriate distribution of courses and a superior quality of work in the major field are essential.

Applications for admission must be approved by the department or division and by the Dean.

Master of Arts.—The student's undergraduate curriculum must have included a program of study substantially equivalent to the Bachelor of Arts major in his chosen field at this University.

Master of Science.—The student's undergraduate curriculum must have included a program of study substantially equivalent to the Bachelor of Science major in his chosen field at this University.

Master of Fine Arts.—A Bachelor of Arts degree at this University with an undergraduate major in drawing and painting, sculpture, or commercial art, or the equivalent.

THE GRADUATE COUNCIL

Doctor of Philosophy.—The student must have an adequate academic preparation for advanced study in the proposed field as evidenced by an approved Bachelor's degree, for provisional status; or one year of acceptable graduate work, for full status; together with acceptable personal qualities and the capacity for creative work.

THE SCHOOL OF MEDICINE

Doctor of Medicine.—Well-qualified candidates are eligible for admission after completing 90 semester hours, or the equivalent, applicable toward a degree in an approved college. However, the majority of applicants are found to be better qualified for the study of medicine after four years of college work. Applicants are required to take the Medical College Admission Test, sponsored by the Association of American Medical Colleges, in advance of the academic year for which application is made. Specific required courses are:

Chemistry:

Inorganic (including 4 hours of laboratory)..... 8
Qualitative analysis may be counted as part of this requirement.

Organic (including laboratory)..... 6-8

The equivalent of a one-year college course

Biology (including 4 hours of laboratory)..... 8

A course in either general biology or zoology

Physics (including at least 2 hours of laboratory)..... 8

English Composition and Literature..... 6

With the exception of these specific requirements applicants are urged to follow their personal interests in developing their premedical courses of study. A well-balanced program, rather than a specific field, is the criterion by which an applicant is judged. It is not advisable to take courses that appear to cover subject matter in the medical program.

Advanced Standing

A student who has satisfactorily completed one or two years at any other medical school approved by the Association of American Medical Colleges and the American Medical Association, and who has the nec-

essary preliminary educational requirements, may apply for advanced standing. Before final admission to the third year class, the applicant must have passed Part I examination of the National Board of Medical Examiners.

Selection Procedures

The Committee on Admissions is guided in the selection of students by the applicant's academic ability, the results of the Medical College Admission Test, and personal qualifications as determined by letters of reference and personal interview. Applicants are interviewed only by invitation of the Committee.

Each applicant is notified as soon as possible after the Committee makes a decision.

An applicant who is offered a place in a class is required to notify the Director of Admissions within two weeks of his intent to accept the place reserved for him and to remit a deposit of \$100 not later than January 15th prior to the opening of classes of the academic year for which he applied. This deposit will not be refunded after January 15th. It will be credited toward the tuition for the first semester.

Accompanying the offer of a place in class will be forms for a report on physical condition. This report must be completed and returned to the Director of Admissions by the applicant's physician within two months of receipt of the letter of acceptance.

THE LAW SCHOOL

For the Degrees of Bachelor of Laws and Juris Doctor

Bachelor of Laws.—A Bachelor of Arts or equivalent degree awarded upon completion of a four-year course in an approved college or university is required. The baccalaureate record must be of satisfactory quality and must include an acceptable distribution of courses. Eligibility is evaluated on the basis of personal and scholastic records, supplemented by the result on the legal aptitude test. An applicant will not be admitted who has been in attendance at another law school and who is ineligible to return to that school in good standing. From the applicants, a selection will be made by the Committee on Admissions.

Information concerning the legal aptitude test may be obtained from the Dean of the Law School or from the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

Juris Doctor.—A student does not register as a candidate for the degree until his last year in the Law School. For details, see page 122.

ADVANCED STANDING

Advanced standing toward the degree of Bachelor of Laws will be granted only for work successfully completed in other law schools which

are members of the Association of American Law Schools. However, credits will not be recognized in excess of those which might be obtained in a similar period in this Law School.

Advanced standing will not be granted for law work already counted toward the Bachelor of Arts or other pre-legal degree.

Advanced standing will not be granted toward meeting the requirements for the degrees of Juris Doctor or Master of Laws.

For the Graduate Degrees

*Master of Laws.**—A Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree from a member school of the Association of American Law Schools are required. Candidates for admission must have attained a *B* average on all work done for the Bachelor of Laws degree, except that, at the discretion of the Committee on Graduate Studies, applicants otherwise eligible may be admitted on proof of experience and attainment as an alternative. Advanced standing will not be granted for credits earned while a candidate for the first degree in law. Credits earned as an unclassified student will not be applicable toward meeting the requirements of the degree unless specific provision therefor is included in the letter of admission.

Master of Comparative Law and Master of Comparative Law (American Practice).—The following are required: (1) the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycée, or liceo; and (2) graduation in law from a recognized foreign university where training was in Civil Law.

Doctor of Juridical Science.—The following are required: a Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree, earned with high rank, from a member school of the Association of American Law Schools, and outstanding capacity for scholarly work in the field of law.

Unclassified Students

A person who is in good standing as a degree candidate in another law school which is a member of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student in order to earn credits for transfer to the other law school.

A person who is a member of the bar or a person, not a member of the bar, who is a graduate of a member school of the Association of

*One half of the work necessary for graduation from an approved college or university completed prior to entry into military service may be accepted as satisfying the admission requirement for pre-legal work, provided the applicant completed not less than twenty months of continuous service in the armed forces of the United States during World War II and prior to the beginning of the 1948-49 fall semester.

American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student.

Unclassified students participate in the work of the course and take examinations. Courses taken by unclassified students will not be credited toward degrees at this Law School.

Continuing Legal Education Students

A simplified admission and registration procedure is provided for members of the bar desiring to register as continuing legal education students to take courses on a noncredit basis. Registration as a Continuing Legal Education student does not entitle the registrant to participate in the student activities or benefit from the medical privileges of the University. Members of the bar desiring to register as degree candidates or as unclassified graduate students should file the regular application for admission form.

THE SCHOOL OF ENGINEERING

The applicant for undergraduate or graduate work must be of good character and must have had academic background appropriate for the program of studies contemplated.

For Undergraduate Study

For the Degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering.—Consideration for admission is based upon the combined evidence of the following factors:

1. An acceptable certificate of graduation from an accredited secondary school showing a minimum of fifteen "units"*
2. The principal's statement that the applicant is adequately prepared to undertake college work with reasonable prospect of success
3. Scores on the Scholastic Aptitude Test of the College Entrance Examination Board, which is required. (For details, see pages 13-14.)

The Committee on Admission and Advanced Standing will consider the adequacy of the qualifications for academic success of an applicant who, because of unusual circumstances, does not present all of the formal requirements stated above. The Committee may prescribe appropriate tests when necessary.

Nine and one-half of the fifteen units required for entrance must be distributed as follows: three in English, two in algebra, one in plane geometry, one-half in plane trigonometry, one in physics or chemistry, and two in one foreign language or history. Although not required, one-half unit of solid geometry and both physics and chemistry are strongly

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

recommended. A graduate of an approved high school who does not offer for admission the particular subjects required for the engineering curriculum, but who does present not less than fifteen acceptable units, may be admitted on condition, if such deficiency in the distribution of units does not exceed two units.

ADVANCED STANDING

Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be assigned by the School of Engineering to the extent that the work taken at previous institutions meets the requirements for the degree sought at this University, and subject to the general University regulations concerning satisfactory subsequent work.

For Graduate Study

Master of Engineering Administration and Master of Science in Engineering.—For admission to graduate study the student must hold a Bachelor's degree from a recognized institution; satisfy the Committee on Graduate Studies of his capacity for productive work in the discipline; and give evidence of preparation which, in the opinion of the Committee, is adequate for graduate study in the field selected.

Applicants who have significant deficiencies in their preparation for graduate study may undertake prescribed undergraduate programs to qualify for admission as graduate students in the School of Engineering.

In some cases such undergraduate study may be carried on in addition to a limited graduate program. In no case may the undergraduate courses fulfill any part of the requirements for the graduate degree.

FOR DEGREE CANDIDACY

Application for admission to candidacy for a Master's degree must be made in writing to the Committee on Graduate Studies. To be accepted the applicant must have (1) been accepted for graduate study, (2) satisfactorily completed nine semester hours of graduate courses, and (3) give evidence of satisfactory personal and intellectual qualifications. In exceptional cases the requirement of nine semester hours of graduate courses may be reduced.

Doctor of Science.—For admission the student must possess adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. The applicant must have capabilities and interests beyond the ability to assimilate organized materials in formal courses of instruction. Originality of mind combined with balanced judgment and accuracy in observation or experiment are necessary to the successful applicant.

THE SCHOOL OF PHARMACY

For the Bachelor's Degree

Bachelor of Science in Pharmacy.—An Associate in Arts degree based on the curriculum in Pharmacy in the Junior College (see pages 71-72), or the equivalent, is required.

A student who has received a Bachelor's degree from an accredited institution or who has completed work in the general cultural or foundational subjects of the pharmacy curriculum may be admitted to advanced standing. No more than one year of advanced standing will be granted a student from any institution other than an accredited college of pharmacy.

For the Master's Degree

Master of Science in Pharmacy.—A Bachelor of Science degree from an accredited institution is required. A superior record and professional promise are essential.

THE SCHOOL OF EDUCATION

For the Bachelor's Degrees

Bachelor of Arts in Education, Bachelor of Science in Home Economics, Bachelor of Science in Physical Education.—An Associate in Arts degree based on the *Education, Home Economics, or Physical Education* curriculum in the Junior College (see pages 72-73), or the equivalent from another accredited higher institution, or a certificate of graduation from an approved normal school or the equivalent is required. With the exception of Home Economics, applicants must be in possession of personality traits that give promise of success as a teacher.

For the Master's Degree

Master of Arts in Education.—To be admitted to candidacy for the degree of Master of Arts in Education the applicant must: (1) hold a Bachelor's degree from an accredited institution; (2) have an undergraduate quality-point index of 2.50 or above (C+ average); (3) have demonstrated a genuine interest in teaching; (4) be in possession of personality traits that give promise of better-than-average success as a teacher.

To be admitted to candidacy in programs designed to prepare for service in guidance and administration two years of successful teaching experience are prerequisite.

For the Advanced Professional Certificate

Advanced Professional Certificate.—The Bachelor of Arts degree in Education or the Bachelor of Science degree in Physical Education from

the School of Education, or the equivalent from another institution of higher learning; a Master's degree, from an accredited institution of higher learning; at least two years of successful teaching experience; and a permanent teaching or administrative license are required.

For the Doctor's Degree

Doctor of Education.—The degree of Master of Arts in Education, or the equivalent, and at least three years of satisfactory educational experience are required.

THE SCHOOL OF GOVERNMENT

For the Bachelor's Degree

Bachelor of Arts in Government.—An Associate in Arts degree based on the *Foreign Affairs, Public Affairs, Accounting, Business Administration, or Business and Economic Statistics* curriculum in the Junior College (see page 75), or the equivalent, is required.

For the Master's Degrees

A Bachelor's degree from an accredited college or university is required. A student from an unaccredited institution may be admitted at the discretion of the Committee on Admission and Advanced Standing, but will be required to take such extra work above the minimum requirements as may be prescribed.

A student admitted to candidacy must have attained a quality-point index of 3.00 (a *B* average) in his undergraduate major. An applicant whose scholastic average is below 3.00 in his major, or who lacks prerequisite courses, may be referred to the Division of Special Students to make up the deficiency.

Master of Arts in Government.—The applicant's undergraduate program must have included prerequisite courses, corresponding to an undergraduate major at this University, for the chosen field of graduate study.

Master of Arts in Public Administration.—An undergraduate major in a social science or equivalent work experience is required.

Master of Arts in Personnel Administration.—An undergraduate major in a social science or education, with the appropriate courses in psychology, is required.

Master of Business Administration.—(1) In general business administration: an acceptable undergraduate major in Business Administration, or the equivalent, is required. Applicants who are deficient in such course work may be admitted and will be required to make up deficiencies over and above the normal Master of Business Administration program. (2) In the field of *Hospital Administration*: a Bachelor's degree from an accredited college or university is required. While a 3.00 (*B*) average in the undergraduate major is expected, consideration is given in the

selection of candidates to personal qualifications, aptitude for hospital administration, and practical experience.

For the Doctor's Degree

Doctor of Business Administration.—A Master's degree in Business Administration or a related field, or the equivalent, and proficiency in statistics and accounting to the satisfaction of the Committee on Doctoral Studies are required.

THE COLLEGE OF GENERAL STUDIES

For information concerning the College of General Studies see pages 196-200.

THE DIVISION OF UNIVERSITY STUDENTS

Students 21 years of age or over who are not interested in working for a degree in this University may be considered for admission to the Division of University Students to take courses for which they have adequate preparation, as evidenced by previous scholastic records.

Students under 21 years of age who meet the entrance requirements of the Junior College but who are not seeking degree candidacy at this University may be admitted to the Division of University Students to pursue programs of study approved by the Dean.

If a student currently or previously registered in the Division of University Students applies for admission to degree candidacy, a maximum of 45 semester hours of credit will be considered for assignment, in so far as these credits are appropriate toward the degree sought.

In special instances, with the permission of the instructor, a person may be considered for admission as an auditor in a class without being required to take active part in the exercises or to pass examinations, but no credit will be allowed for such attendance.

THE DIVISION OF SPECIAL STUDENTS

This is a non degree-granting division of the University in which the Director of Admissions may authorize the placement of students in the process of making up entrance deficiencies to degree-granting colleges and schools of the University.

Complete credentials must be submitted and evaluated before a tentative or definite plan of make-up may be prepared.

THE DIVISION OF AIR SCIENCE

The applicant must be a regularly enrolled, full-time, student; at least fourteen years of age; a citizen of the United States; physically fit; of good character; and a candidate for a Bachelor's degree.

CLASSIFICATION OF STUDENTS

Regular Students.—Regular students are those who have met the entrance requirements for candidacy and are registered for degrees.

University Students.—Persons not seeking degrees, as specified in the rules of the Division of University Students, may be admitted to this Division to pursue courses for which they have had adequate preparation.

Special Students.—Special students are those who are in the process of qualifying for admission to curricula in degree-granting colleges and schools of this University.

Additional information concerning curricula, courses offered, entrance requirements, or admission procedure may be obtained from the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone—STerling 3-0250, extension 345.

REGISTRATION

Before a student may be admitted to registration he must have satisfied the Office of the Director of Admissions that he is qualified to enter the University (see "Admission", pages 13-25).

A student who has previously matriculated in the University, but who has not been in attendance during the semester prior to registration, should file an application for readmission in advance of registration.

Registration is for the semester unless otherwise indicated on the registration paper. No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in The George Washington University and another institution without the permission of the dean of the college, school, or division in which he is registered in The George Washington University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration*. Allowance of credit for work done concurrently will be at the discretion of the appropriate Committee on Admission and Advanced Standing.

TIME AND PLACE OF REGISTRATION

Registration for all colleges, schools, and divisions except as listed below is conducted in Building C, 2029 G Street NW., during the following periods: *fall semester*, September 22 and 23, 10:00 A.M. to 8:00 P.M.; September 24, 10:00 A.M. to 1:00 P.M. *Spring semester*, February 2 and 3, 10:00 A.M. to 8:00 P.M., February 4, 10:00 A.M. to 1:00 P.M.

For the Law School: Stockton Hall, 720 Twentieth Street NW., days and hours as listed above.

For the School of Engineering: Tompkins Hall, 725 Twenty-third Street NW., undergraduate: days and hours as listed above. For graduate students: September 20 and 21, February 1 and 2, 11:00 A.M. to 8:00 P.M.

For the School of Medicine: School of Medicine, 1335 H Street NW., September 15, 10:00 A.M. to 4:00 P.M.

For the College of General Studies: at times and places designated in individual course announcements.

REGISTRATION CHANGES AND WITHDRAWALS

For regulations governing changes in registrations and withdrawals, see pages 28, 30, 53-54.

FEES AND FINANCIAL REGULATIONS

By authorization of the Board of Trustees, the following fees have been adopted, effective September 1, 1960:

TUITION FEES

For each semester hour* for which the student registers (except for work in the Law School, for courses in Departments of Instruction in the School of Engineering, for courses in the College of General Studies Off-Campus Division, for work toward a Master's degree in Engineering, and for work taken by a candidate for a Doctor's degree)	\$24.00
For each semester hour for which the student registers in the Law School	25.00
For each semester hour for which the student registers for courses in Departments of Instruction in the School of Engineering.....	25.00
For the degree of Doctor of Medicine, for two semesters†.....	1,200.00
For the degree of Doctor of Philosophy‡, Doctor of Education, or Doctor of Business Administration:	
For work§ leading to and including the Council Fellowship or General examination||.....	800.00
For work leading to and including the final examination||.....	800.00
For the degree of Doctor of Juridical Science:	
For work leading to and including the final examination||.....	800.00
For the degree of Master of Engineering Administration:	
For work leading to and including the Comprehensive Examination|| .....	700.00
For the degree of Master of Science in Engineering:	
For work leading to and including the Comprehensive Examination|| .....	800.00
For the degree of Doctor of Science:	
For work leading to and including the Qualifying Examination...	1,200.00
For work leading to and including the final examination.....	1,200.00

ADDITIONAL COURSE FEES

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is

* Payment of tuition for a Master's thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered "in residence" during this period. If the preparation of the thesis extends beyond the second academic year, it must be registered for again, and tuition paid on the same basis as for a repeated course.

† Registration in the School of Medicine is for a period of two semesters. After the student has entered the course of instruction he is obligated for the full tuition for two semesters. No part of the tuition will be refunded upon withdrawal or dismissal for any cause.

‡ The tuition fee is to be paid in two years at the rate of \$200 a semester or in full at the time of registration. No residence fee will be charged if a third year is needed for completion of either part of the degree requirements.

§ This fee does not cover the cost of tuition for elementary courses (numbered 1 to 100).

|| When a limited schedule is carried which extends the time of completion of the program of study to more than one year, the proportionate part of the charge may be fixed by the Treasurer.

charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

GRADUATION FEES

Wherein the degree of Associate in Arts or Associate in Science is granted	10.00
Wherein a degree other than the Associate in Arts or Associate in Science degree is granted	25.00
Wherein an Advanced Professional Certificate in Education is granted	25.00
FEE FOR BINDING MASTER'S THESIS	6.00
FEE FOR PRINTING SUMMARY OF DOCTORAL DISSERTATION	85.00

SPECIAL FEES

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	10.00
Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable	5.00
Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable	5.00
Admission tests (when required)	6.00-12.00
Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree in Columbian College, the School of Engineering, the School of Government, or the College of General Studies at the time of registration for the final semester of study (excluding summer sessions)	10.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program involving one course or more than one course	2.00
Withdrawal fee, charged each student who preregisters and withdraws prior to the regular registration	5.00
Service fee, charged each student for late payment of tuition (see "Payment of Fees")	2.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees	5.00
Residence fee, charged each student granted "leave of absence" status for the academic year in the School of Medicine	50.00
Residence fee, charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements:	
In the Law School	25.00
In the School of Engineering†	25.00
In all other colleges, schools, and divisions	24.00
For special physical examination	2.00
Special fee, Law School (\$1.25, Student Bar Association activities; \$1.75, <i>Law Review</i>), charged each student in the Law School for each semester or any part thereof except the summer term	3.00

* Payable at the time of application for transfer or readmission.

† Candidates for the Master's degrees in the School of Engineering who have paid in full the fee for work leading to and including the Comprehensive Examination but whose Comprehensive Examinations have not been completed will be granted one semester without payment of residence fee.

Engineers' Council fee, charged each student in the School of Engineering for each semester or any part thereof except the summer term	1.50
For each examination to qualify for advanced standing and for each special examination	5.00
Laboratory checkout fee, charged each student in chemistry and pharmacy courses who fails to check out of the laboratory by the time set by the instructor.....	3.00
Transcript fee, charged for each transcript of record after the first..	1.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library facilities, except as otherwise designated; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described under Health Administration. These privileges, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

In exceptional cases, subject to the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

Arrangements for the above may be made with the Office of the Cashier at the time of registration.

A student who fails to meet payments when due, but who pays his fees within the following two weeks of the date on which payment is due, is charged a service fee of \$2. A student who fails to meet payments within these two weeks after payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of \$5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension.

* The University work week is Monday through Friday, inclusive.

sion. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the dean of the college, school, or division in which the student is registered. Notification to an instructor is not an acceptable notice (see "Withdrawal", pages 53-54).

In authorized withdrawals and changes in schedule, financial adjustments will be made as follows:

Fall Semester.—Withdrawal dated on or before the last working day* in October, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in November, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in November.

Spring Semester.—Withdrawal dated on or before the last working day* in February, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in March, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in March.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and is cancelled before the regular registration day. In this case a withdrawal fee of \$5 is charged and tuition fees refunded. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

Any student in chemistry or pharmacy who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a checkout fee in the amount of \$3. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Any student enrolled in the Air Force ROTC who fails to turn in uniforms, equipment, and textbooks, on separation from the Corps, will be charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

* The University work week is Monday through Friday, inclusive.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, FINANCIAL AID

FELLOWSHIPS AND GRADUATE ASSISTANTSHIPS

The following fellowships and graduate assistantships are available. Unless otherwise specified, applications should be submitted not later than April 1 preceding the period for which the award is to be made. They should be directed as indicated in the description of the fellowship or graduate assistantship concerned and addressed to The George Washington University, Washington 6, D.C.

University Teaching Fellowships.—These are assigned for the academic year to the various departments of instruction. The applicant is expected to be a prospective candidate for a Doctoral degree in the general field of his future doctoral study. Each teaching fellow receives an annual stipend (on a nine-month basis) of up to \$1,700 plus full tuition and laboratory fees for whatever schedule of study or research his fellowship duties permit him to carry. Stipends vary with the work load of the individual teaching fellow. Normally a University teaching fellow renders half-time service in classroom or laboratory assignments to the department of instruction directing his doctoral study. Application should be made to the executive officer of the department of instruction concerned.

Graduate Teaching Assistantships.—These are open in various departments of instruction to candidates for the Master's degrees. Each graduate teaching assistant renders a designated unit of service to his major department of instruction, and receives, depending upon his teaching or laboratory assignment, up to \$1,700 on a nine-month basis plus tuition and laboratory fees for the program of studies which the duties of his assistantship permit him to carry. Application should be made to the executive officer of the department of instruction concerned.

Law School Research Assistantships.—Student research assistantships are available each year to students currently enrolled in the Law School, preference being given to applicants who are completing their second year. Each assistant receives an annual stipend. Awards are made on the basis of academic standing, financial need, and capacity for leadership. Research assistants have duties similar to those of teaching fellows. Applications should be submitted to the Dean of the Law School not later than May 1.

Law School Teaching Fellowships.—Teaching fellowships are available each year in the Law School to prospective candidates for the Master of Laws degree. Each fellow receives an annual stipend, plus tuition for

the academic year. Teaching fellows follow an approved program of study and research, assist members of the Faculty in the guidance of first-year students, and supervise student work in legal bibliography and the drafting of legal instruments. Upon satisfactory completion of the year's work, a fellow is recommended for the degree of Master of Laws. Applications should be submitted to the Dean of the Law School not later than May 1.

SPECIAL FELLOWSHIPS

The following Special Fellowships, supported by endowment, are available. Inquiry concerning them should be addressed to the executive officer of the department concerned.

Isabella Osborn King Research Fellowships.—Fellowships varying in amount from \$750 to \$3,000, established in 1927 by bequest of Mrs. Isabella Osborn King, are offered in the biological sciences and are intended to foster research for which the libraries and scientific establishments in Washington provide special facilities.

Robin Miller Research Fellowship.—A fellowship in medicine in the amount of \$1,800, established in 1953 by bequest of Mrs. Robin Miller, is offered for the study of cardiovascular diseases.

Thomas Bradford Sanders Fellowships.—Fellowships varying in amount from \$900 to \$1,500 plus tuition, established in 1928 by bequest of Miss Addie Sanders in memory of her brother, Thomas Bradford Sanders, are offered in various departments of science.

The following Special Fellowships are made possible by annual gifts. *Scottish Rite Fellowships.*—The Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction, U.S.A., offers fellowships each in the amount of \$1,800, to graduates of accredited colleges who wish to enroll in the School of Government to train for government leadership—federal, state, or local. The territory includes the Orients of Alabama, Alaska, Arizona, Arkansas, California, Colorado, District of Columbia, Florida, Georgia, Hawaii, Idaho, Iowa, Kansas, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wyoming, Panama, Puerto Rico, and the Bodies of Taiwan, Japan, Okinawa, and Guam.

The above fellowships are available to residents of the respective states or countries, and application therefore should be made to the Sovereign Grand Inspector General of the Supreme Council, 33°, of the Southern Jurisdiction, U.S.A., of the Orient (state or country) from which the application is to be made.

Wolcott Foundation Fellowships.—Fellowships sponsored by the Wolcott Foundation of High Twelve International are available to

graduates of accredited colleges who wish to enroll in the School of Government for graduate work in Foreign Affairs, Public Administration, Personnel Administration, or Business Administration. Preference is given to students who themselves are affiliated with, or whose parents are affiliated with, High Twelve International or the Masonic Order. The fellowships cover tuition for one calendar year of graduate study in residence. Where need is shown, a living allowance up to \$100 a month may be granted.

NATIONAL FELLOWSHIPS

National Defense Graduate Fellowships.—Under the National Defense Education Act, fellowships are available at this University in Romance Languages and Literature at \$2,000 (with an increase of \$200 each for the second and third years) plus \$400 a year for each dependent; tuition is waived. Application should be made to the Graduate Council.

National Science Foundation Cooperative Graduate Fellowships.—These fellowships at \$2,200 for twelve months or \$1,600 for nine months, with tuition waived, are available in the mathematical, physical, medical, biological, and engineering sciences and in certain other fields regarded as employing scientific methods.

National Science Foundation Summer Fellowships for Graduate Teaching Assistants.—These summer fellowships are available at not less than \$50 or more than \$75 a week for a period of 8 to 12 weeks; tuition is waived. Application should be made to the Graduate Council.

SCHOLARSHIPS

Scholarships are awarded for the academic year unless otherwise specified and are credited in equal parts for each semester. Each holder must carry a full schedule of academic work (fifteen semester hours or in the professional schools, the full prescribed schedule) during the period for which the scholarship is awarded.

OPEN TO INCOMING FRESHMEN

The following scholarships are awarded to outstanding members of graduating classes of accredited secondary schools. With the exception of the Grants-in-Aid Scholarships, applicants must be unmarried citizens of the United States who are not receiving veterans' benefits under any public law.

Applicants must apply for admission to the University and be accepted before their scholarship applications can be considered. Forms for application for admission to the University are available at the Office of the Director of Admissions, The George Washington University, Washington 6, D.C.

Scholarship application should be made in writing on or before April first for the following academic year and, unless otherwise specified, should be addressed to the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D.C. Awards are made during the month of April. All scholarships begin with the fall semester.

Alpha Zeta Omega Scholarship.—This scholarship, in the amount of \$500, was established by Pi Chapter of Alpha Zeta Omega Pharmaceutical Fraternity. It is awarded annually to a member of the graduating class of one of the public high schools of the District of Columbia, nearby Maryland, or Virginia who intends to enroll in the pharmacy curriculum and complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

Alumni Scholarships.—Five scholarships are available each year in the Junior College, upon the recommendation of regional alumni clubs, to outstanding men graduating from accredited high schools. The scholarships cover tuition costs for four semesters (beginning with the fall semester) of full-time work but do not include special fees such as laboratory charges, room, board, or other expenses. To retain the scholarship, the student must maintain a *B* average. Additional information may be obtained from the Director of Alumni Relations.

*Association of Federal Communications Consulting Engineers Scholarship.**—This scholarship, which includes tuition, laboratory fees, and books, established in 1958 by the Association of Federal Communications Consulting Engineers (AFCCE), is available to a student of good character, promise, and leadership pursuing a course of study leading to a Bachelor of Electrical Engineering degree and intending to major in communications.

*Capital Farm and Garden Scholarship.**—This scholarship, in the amount of \$400, established in 1958 by the Woman's National Farm and Garden Association, Inc., is available to an outstanding girl student from the District of Columbia in the field of home economics and related fields.

*Crown Photo Scholarship.**—This scholarship, in the amount of \$500, established in 1958 by the Crown Photo Service of Washington, D.C., is to be awarded annually to a member of the graduating class of one of the public high schools of the District of Columbia, nearby Maryland, or Virginia, who intends to enroll in the pharmacy curriculum and complete the requirements for the degree of Bachelor of Science in Pharmacy.

District of Columbia Pharmaceutical Association Scholarship.—This scholarship, in the amount of \$500, was established in 1954. It is awarded annually to a member of the graduating class of one of the

* This scholarship is renewable and is, therefore, not available each year for award to an incoming freshman.

public or parochial high schools of the District of Columbia, nearby Maryland, or Virginia who intends to enroll in the pharmacy curriculum and complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

Estella Constance Drane Scholarship.—This scholarship in the amount of \$200, established in 1957 by bequest of Estella Constance Drane in memory of the boys of the former Washington Business High School who served in World War I, is available annually to a graduate of Roosevelt High School upon the recommendation of the Scholarship and Award Committee of the faculty of Roosevelt High School and the approval of the Committee on Scholarships of The George Washington University.

School of Engineering Scholarships.—Four scholarships are available each year in the School of Engineering to graduates of accredited secondary schools. The holders of these scholarships must carry a full program in the School of Engineering.

Each scholarship is a full-tuition scholarship but does not cover special fees. Each scholarship is for four academic years (summer work is not to be included), provided the holder thereof meets all academic and other standards of the University.

To retain a School of Engineering scholarship, an average of *B* and a satisfactory standard of deportment must be maintained. In case a student marries after the award is made, the scholarship is forfeited. If for any reason a holder of a School of Engineering scholarship resigns or is dropped from said scholarship, the scholarship remains unfilled.

Application should be made on the School of Engineering Scholarship Application Form, which is available in the Office of the Dean of the School of Engineering.

General Motors College Scholarship.—This scholarship, established in 1955 by General Motors Corporation, is available for an incoming freshman student who is a citizen of the United States and demonstrates outstanding talent, high personal qualifications, and financial need. The amount of the award has been made flexible and will range from an honorary award of \$200, up to an award of \$2,000 per year, depending upon the demonstrated need of the individual. It is renewable for the four years of undergraduate work provided the student continues to meet the high standards established for the holder of this award.

Grants-in-Aid Scholarships.—The University has established a limited number of Grants-in-Aid Scholarships for men and women which are awarded annually by the University Committee on Scholarships. These grants are designed to promote the physical, mental, moral, and educational leadership of worthy young men and women. Such aid in no instance shall exceed the amount of institutional expenses. Inquiries should be addressed to the Office of Men's Athletics.

High School Scholarships.—The Board of Trustees of the University offers thirty-four scholarships to graduates of public high schools in the Washington Metropolitan Area: sixteen in the District of Columbia area; four each in the Montgomery, Prince Georges, Arlington, and Fairfax areas; and two in the Alexandria city area, the home city of General George Washington. Scholarships are divided equally between men and women. One of the District of Columbia Scholarships, designated as the *Amos Kendall Scholarship*, was established in 1869 by the late Honorable Amos Kendall.

Each scholarship is awarded annually to a member of the graduating class who plans to enroll in the Junior College for the freshman and sophomore years and thereafter in Columbian College or any one of the professional schools announcing a preprofessional curriculum in the Junior College. The scholar must register the following September and carry each semester a full academic program as prescribed in the Junior College curricula or in the college or school in which he carries his upper division work; in no case is the scholar permitted to carry less than fifteen semester hours.

Each scholarship is a full-tuition scholarship but does not cover special fees. Each scholarship is for four academic years (summer work is not to be included), provided the holder thereof meets all academic and other standards of the University.

To retain a high school scholarship, an average of *B* and a satisfactory standard of deportment must be maintained. In case a student marries after the award is made, the scholarship is forfeited. If for any reason a holder of a high school scholarship resigns or is dropped from said scholarship, the scholarship remains unfilled.

Nominations are made by principals and counselors of participating high schools. Inquiries should be addressed to the high school counselor.

High School Discussion Conference Scholarships.—Three scholarships are available each year in the Junior College to high school seniors who participate in the George Washington University High School Discussion Program. These scholarships cover tuition for one year, but do not include laboratory fees or other special fees. For information concerning application, consult the Department of Speech. Nominations are made by principals of participating high schools.

Levin M. Powell Scholarships.—These full tuition scholarships, established by the bequest of Admiral Levin M. Powell in 1886, are available to young men desiring to prepare for entrance into the Naval Academy at Annapolis, Maryland. The number of scholarships awarded each year will be determined by the income from the endowment.

*Texaco Scholarship.**—This scholarship, established in 1956 by the

* This scholarship is renewable and is, therefore, not available each year for award to an incoming freshman.

Texas Company, covers tuition, fees, and textbooks, and is awarded annually to a young man entering the freshman class in a curriculum which will prepare him for a career in the petroleum industry. It is renewable for the four years of undergraduate work provided the student maintains high standards of scholarship and deportment.

FOR STUDENTS WITH ESTABLISHED ACADEMIC RECORDS
AT THIS UNIVERSITY

American Foundation for Pharmaceutical Education Scholarship.—A scholarship fund, in the amount of \$400, established by the American Foundation for Pharmaceutical Education, is available annually to junior and senior students of the School of Pharmacy who are in the upper quarter of their class or who are maintaining average grades of not less than B. The scholarship funds are awarded on the recommendation of the Committee on Scholarship of the School of Pharmacy.

American Society of Women Accountants.—This scholarship, in the amount of \$100, established in 1953 by the District of Columbia Chapter of the American Society of Women Accountants, is available to a sophomore, junior, senior, or postgraduate woman majoring in accounting whose academic record is good and who needs aid in continuing her education.

Frederick Albert and Alma Hand Britten Scholarships.—These scholarships, established in 1959 by bequest of Alma Hand Britten, in amounts to be specified from time to time by the Trustees, are available to needy full-time graduate or undergraduate students registered in the School of Engineering, who would not otherwise be able to pursue such professional study.

Byron Andrews Scholarship.—This scholarship, in the amount of \$300, established in 1920 by Mrs. Belle Fisk Andrews in memory of her husband, Byron Andrews, is available "for ambitious and needy students, who desire to pursue courses in English, Latin, journalism, history, literature, or political science".

Anna Bartsch Hospital Intern Scholarship.—This scholarship, in the amount of \$180, established in 1946 by Dr. Anna Bartsch-Dunne as a memorial to her mother, Anna Bartsch, is available to a woman intern in the George Washington University Hospital. Award is made upon the recommendation of the Hospital's Internship Committee.

Anna Bartsch Medical Student Scholarship.—This scholarship, in the amount of \$500, established in 1946 by Dr. Anna Bartsch-Dunne, as a memorial to her mother, Anna Bartsch, is available to a woman in the School of Medicine, "of outstanding scholarship, character, and promise, who intends to make the practice of medicine her life profession". The award is made upon the recommendation of the Faculty of the School of Medicine.

Everett Lamont Bradley Scholarship.—This scholarship, in the amount of \$175, established in 1954 by bequest of Alice R. H. Bradley in memory of her son, Everett Lamont Bradley, is available to a student in the School of Medicine.

Emma K. Carr Scholarships.—Four scholarships in the amount of \$400 each and ten of \$100 each, established in 1932 by Mrs. Emma K. Carr, are available to "young men (of the white race) for undergraduate or postgraduate work, considering character, capacity, and need".

Henry Harding Carter Scholarship.—This scholarship, in the amount of \$500, established in 1896 by Mrs. Maria M. Carter in memory of her husband, Henry Harding Carter, is available to a deserving student who is preparing for the civil engineering profession.

Maria M. Carter Scholarship.—This scholarship, in the amount of \$50, established in 1871 by Mrs. Maria M. Carter, is available to a young man.

Daughters of the American Revolution Scholarship.—This scholarship, in the amount of \$475, established in 1952 by the District of Columbia Daughters of the American Revolution, is available to junior and senior students, preferably women, who are descendants of patriots of the American Revolution.

Isaac Davis Scholarship.—This scholarship, in the amount of \$50, was established in 1869 by the Honorable Isaac Davis of Massachusetts. Nominations for the scholarship may be made "by the founder or his eldest lineal descendant". In case no such nomination is made, the scholarship is to be awarded by the University.

Charles Worthington Dorsey Memorial Scholarship.—This scholarship, established in 1947 as a memorial to Charles Worthington Dorsey, Bachelor of Laws, '81, Master of Laws, '82, is awarded upon the recommendation of the Faculty of the Law School to a needy and promising graduate of Columbian College or other division of the University, with a Bachelor of Arts or other equivalent degree, who has maintained an average of B as an undergraduate student and who desires to pursue the study of law as a full-time student. The scholarship covers tuition for the course leading to the first degree from the Law School, Bachelor of Laws or Juris Doctor, provided that the holder maintains an average of B. The right is reserved to suspend the benefits of the scholarship for cause at any time. This scholarship is awarded ordinarily once every three years.

Henry Parsons Erwin Scholarship.—This scholarship, in the amount of \$300, established in 1955 by Mrs. Helen B. Erwin as a memorial to her husband, Henry Parsons Erwin, a former Trustee of the University, is available for a student in Engineering.

Robert Farnham Scholarship.—This scholarship, in the amount of \$100,

given to the University in 1871 by Mrs. Robert Farnham, is available to a student in Columbian College.

Esther Brigham Fisher Scholarship.—This scholarship, in the amount of \$75, established in 1951 by the bequest of Mrs. Esther Brigham Fisher, is available to a student in the University.

Georgetown Business and Professional Women's Club Scholarship.—This scholarship, in the amount of \$100, established in 1958 by the Georgetown Business and Professional Women's Club is available to a woman student in the field of Science.

Mildred Green Memorial Scholarship Fund.—The income from this fund of \$3,317, established in 1959 by Alpha Theta Chapter of Pi Lambda Theta, is awarded annually to a student in the School of Education, upon the recommendation of the donor, which is submitted prior to April 1.

Anna Spicker Hampel Scholarship.—This scholarship, in the amount of \$35, established in 1949 by Mrs. Evelyn Hampel Young in memory of her mother, Anna Spicker Hampel, is available for scholarship aid to young married women students in the School of Education or Columbian College.

Elma Lewis Harvey Scholarship.—This scholarship of \$200 was founded in 1921 by Mrs. Emma Elizabeth Harvey in memory of her daughter, and is awarded every four years, or as often as vacant, to a young woman in Columbian College of the Protestant faith and the Caucasian race who shall be selected for scholarship and moral qualifications.

Hazelton Scholarship.—This scholarship, in the amount of \$275, established in 1950 by the bequest of Lillie S. Hazelton, is awarded annually "for the use and assistance of needy and worthy students."

Kappa Alpha Theta Scholarship.—This scholarship, in the amount of \$500, established by the Washington alumnae of Kappa Alpha Theta, is available for the training of a clinician in speech correction.

Kappa Kappa Gamma Scholarship.—This scholarship in the amount of \$500, established in 1959, is awarded to a student planning to follow the profession of speech correction.

Kappa Psi Scholarship.—This scholarship, in the amount of \$150, is made available by Gamma Tau Chapter and the District of Columbia Graduate Chapter of Kappa Psi Pharmaceutical Fraternity. It is awarded annually to a student in the School of Pharmacy who is in need of financial aid.

Law School Scholarships.—Scholarships are available each year in the Law School to graduates of accredited colleges. Each scholarship provides full three-year tuition in the morning division of the Law School. Candidates must have graduated in the upper fifth of their class and must have demonstrated qualities of leadership in addition to scholastic attainment. To retain the scholarship, the successful candidate must

maintain a *B* average. Application must be made before March 1 to the Dean of the Law School.

Eugene and Agnes E. Meyer Scholarships.—A scholarship fund, in the amount of \$3,500, established in 1952 by the Eugene and Agnes E. Meyer Foundation, is available annually "to assist promising students or applicants in meeting the costs of furthering their education, with preferential consideration to children of persons who are employed in public service, including service in the armed forces or the judiciary."

A. Morehouse Scholarship.—This scholarship was established by Mr. A. Morehouse in 1861. It carries an annual stipend of \$60, which is available for an undergraduate "intending to enter the Christian ministry".

Newspaper Scholarships.—One scholarship is available each year to a candidate recommended by each of the following newspapers: *The Washington Daily News*, *The Washington Post and Times Herald*, and *The Evening Star*. The holder of the scholarship must be an employee of the newspaper. These scholarships are valid for four academic years, provided the holder continues in the employ and is recommended by the newspaper, and maintains a satisfactory academic record and a high standard of deportment. They cover tuition but do not include laboratory fees, graduation fees, or other special fees.

Panhellenic Association of Washington, D. C., Scholarship.—A scholarship, in the amount of \$300 to be applied to tuition fees, has been established by the Panhellenic Association of Washington, D. C. This scholarship is available annually to a woman student in her sophomore or junior year who is a member of a National Panhellenic Conference sorority, has done the most to promote good social relations among the sororities on the campus, is an outstanding leader in student affairs sponsored by the University, and has a 3.0 (*B*) or better average.

Paul Pearson Scholarship.—This scholarship, in the amount of \$200, established in 1940 by bequest of Paul Pearson and "to be known as the Dr. Paul Pearson award," is available to a student in the School of Pharmacy, upon the recommendation of the Faculty of that School.

Phi Delta Delta Scholarship.—Zeta Chapter of Phi Delta Delta Legal Fraternity (International) offers annually a scholarship in the amount of \$40 to the woman student in the sophomore class who has excelled in scholastic achievement and service to the Law School in her first year.

Phi Delta Gamma Scholarship.—This scholarship, in the amount of \$100, established in 1956 by Beta Chapter of Phi Delta Gamma, is awarded annually to a woman who is a candidate for an advanced degree at the University.

Lula M. Shepard Scholarships.—Two scholarships, in the amount of \$400 and \$150, respectively, established in 1946 by bequest of Lula M. Shepard, are available to "worthy Protestant students desiring to enter the Foreign Service Department of the School of Government".

David Spencer Scholarship.—This scholarship of \$175, established in 1918 by Miss Louisa J. Spencer, is available under certain restrictions.

Mary Lowell Stone Scholarship.—This memorial scholarship, in the amount of \$150, established in 1893, is available to a woman student of science in Columbian College.

Charles Clinton Swisher Scholarships.—These scholarships, in the amount of \$450 and \$300, respectively, established in 1941 by bequest of Professor Charles Clinton Swisher, are available, under certain conditions, to students of medieval history.

University Hospital Scholarships in Medical Technology.—Ten Scholarships are available, each to cover the cost of 24 semester hours of the 30 in the last year of the curriculum leading to the degree of Bachelor of Science in Medical Technology.

William Walker Scholarship.—This scholarship, established in 1824 by William Walker, Esq., carries an annual stipend of \$125, and is available for an undergraduate intending to enter the Christian ministry.

John Withington Scholarship.—This scholarship of \$100, was established in 1830 by the New York Baptist Theological Seminary.

Women's Advertising Club of Washington Scholarship.—This scholarship, in the amount of \$300, established in 1958 by the Women's Advertising Club of Washington, is available each year to a woman entering her junior or senior year in advertising and public relations.

Ellen Woodhull Scholarship.—This scholarship of \$40, established by Ellen M. E. Woodhull, is available to a student in Columbian College.

The Zonta Club of Washington, D. C., Scholarship.—This scholarship, in the amount of \$300, offered by the Zonta Club of Washington, D. C., is available to a woman who is a junior, senior, or graduate student with special interest in a professional or business career.

THE COLUMBIAN WOMEN SCHOLARSHIP FUNDS

The Columbian Women Scholarships are awarded to women students on the basis of financial need and scholastic attainment. Applications for these scholarships should be addressed to the Chairman of the Scholarship Committee, The Columbian Women, The George Washington University, Washington 6, D. C., not later than May 15 for the fall semester, and not later than January 1 for the spring semester. These scholarships are awarded from income of the following endowments:

Nellie Maynard Knapp Scholarship Fund.—Established by a gift of \$5,000 in 1915 in memory of a former president, Nellie Maynard Knapp.

Founders of Columbian Women Scholarship Fund.—A fund of \$5,000 created in 1920.

Lillian Young Herron Scholarship Fund.—A fund of \$5,000 created in 1925 and named in 1930 in memory of a former president.

Elizabeth V. Brown Scholarship Fund.—A fund of \$1,200 created in

1925 by the College Women's Club of Washington, D. C., in memory of Elizabeth V. Brown. This scholarship is restricted to the School of Education.

College Women's Scholarship Fund.—A gift of \$500 in 1926 by the College Women's Club of Washington.

Lewes D. and Myrtie H. Wilson Memorial Scholarship Fund.—A gift of \$1,000 in 1926 by Elizabeth Wilson as a memorial to her parents, Lewes D. and Myrtie H. Wilson. This scholarship is restricted to the School of Medicine.

Grace Ross Chamberlin Scholarship Fund.—A fund of \$2,300 created in 1932 in honor of Grace Ross Chamberlin, a former president.

Janet McWilliams Scholarship Fund.—A fund of \$1,000 established in 1954 by the bequest of Janet McWilliams, a former president.

Rose Lees Hardy Foundation Scholarship Fund.—A fund of \$2,000 created in 1957 in memory of Rose Lees Hardy, an alumna of the University.

Victoria Briggs Scholarship Fund.—A fund of \$500 established in 1959 by the bequest of Victoria Briggs Turner.

PRIZES

Alpha Chi Sigma Prizes.—Alpha Pi Chapter of Alpha Chi Sigma Fraternity offers annually the following prizes:

A *Handbook on Chemistry and Physics* is awarded to each of the three students who carry at least eighteen semester hours during the freshman year and attain the highest averages in freshman chemistry.

The name and year of graduation of the student who has attained the highest quality-point index in courses in chemistry will be inscribed on a bronze plaque. The winner must have had at least sixteen hours of chemistry including the final semester at The George Washington University.

Alpha Delta Pi Prize.—Alpha Pi Chapter of Alpha Delta Pi Fraternity offers an annual prize of \$10 to the woman member of the junior class with the most outstanding record in scholarship, extracurricular activities, and service to the University.

Alpha Kappa Psi Prize.—Beta Mu Chapter of Alpha Kappa Psi Fraternity awards annually a key to the male student who has completed ninety semester hours at The George Washington University and has attained the highest average grade in economics, business administration, public accounting, public finance, and foreign commerce. The name of the winner and the year of the award will be engraved on a plaque in the office of the Dean of the School of Government.

Alpha Zeta Omega Prize.—The Ladies' Auxiliary, Pi Chapter, of the Alpha Zeta Omega Pharmaceutical Fraternity offers annually a copy of *The United States Dispensatory* to the freshman student in pharmacy.

who has completed at least fifteen semester hours in the University and who has attained the highest average in his courses.

American Institute of Chemists Prize.—The District of Columbia Chapter of the American Institute of Chemists offers an annual prize of a medal and a one-year subscription to *The Chemist* to that graduating student, majoring in chemistry, who excels in scholarship and in the personal qualities of integrity and leadership.

Byrne Thurtell Burns Memorial Prize.—This prize of \$55 is awarded to the senior majoring in chemistry who shows the greatest proficiency in organic chemistry, as evidenced by a comprehensive examination, and who possesses such qualifications of mind, character, and personality as to give promise of future achievement.

Martin L. Cannon Memorial Prize.—Pi Chapter of the Alpha Zeta Omega Pharmaceutical Fraternity offers annually a copy of *The United States Dispensary*, in memory of Dr. Martin L. Cannon, to the student in pharmacy receiving his Associate in Arts degree, who throughout his course has obtained the highest grades and at the same time contributed most to the student activities in the School of Pharmacy.

Chi Omega Prize.—Phi Alpha Chapter of Chi Omega Fraternity offers annually a prize of \$25 to be awarded to the woman student in the graduating class with the highest record in the following social sciences: economics, sociology, political science, and history; combined with general excellence.

John Henry Cowles Prizes.—These prizes, founded in 1943 by John H. Cowles, Grand Commander of the Supreme Council of the Thirty-third Degree (Mother Council of the World) of the Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction of the United States of America, are awarded annually to the best two scholars in the senior class of the School of Government. The prizes are as follows: first prize, \$100; second prize, \$65.

DeWitt Clinton Croissant Prize.—This prize of \$50, established by the late Professor DeWitt Clinton Croissant, is awarded annually to the undergraduate student who as a member of one of the University courses in drama, or as a participant in University dramatics, submits to the English Department the best essay on drama or the theatre.

E. K. Cutter Prize.—The E. K. Cutter Prize in English was established by the late Marion Kendall Cutter "for excellence in the study of English." An annual prize of \$55 is awarded to the member of the graduating class whose record in English, combined with general excellence, shows most marked aptitude for and attainment in English studies.

Isaac Davis Prizes.—These prizes, established by the Honorable Isaac Davis, of Massachusetts, in 1847, are awarded annually to such members of the senior class as shall have made the greatest progress in public

speaking during their connection with the University. The prizes are as follows: first prize, \$25; second prize, \$20; third prize, \$15.

The award of these three prizes is determined by a public-speaking contest in which the participants deliver original orations. Only members the senior class who are candidates for the degree of Bachelor of Arts or Bachelor of Science are eligible to compete.

Delta Gamma Prize.—Beta Rho Chapter of Delta Gamma Fraternity offers annually a prize of \$10 to the woman member of the freshman class who at the end of that year has the most outstanding record in scholarship, extracurricular activities, and service to the University.

Delta Zeta Prize.—Delta Zeta Sorority offers annually a prize of \$10 to be awarded to the student maintaining the highest average in Zoology 1-2.

Elton Prize.—The Elton Prize of \$30, established by the Reverend Romeo Elton, of Exter, England, is awarded annually to the student having the highest average in the most advanced course in the Greek language and literature.

Jesse Frederick Essary Prize in Journalism.—This memorial prize of \$200, established in 1948 by the late Helen Essary Murphy, is awarded annually to a student who has given promise of sound citizenship and who submits the best printed and published evidence of ability in "forthright reporting" and good journalistic writing, either in a student publication or elsewhere.

Joshua Evans III Prize in the Political and Social Sciences.—This memorial prize of \$100, "established by friends because of an outstanding life," is awarded annually to that man in the graduating class of The George Washington University "who has demonstrated his signal ability in the social and political sciences and who has given promise of the interpretation of that ability in good citizenship among his fellows."

Willie E. Fitch Prize.—The Willie E. Fitch Prize of \$75, established in 1883 by James E. Fitch, in memory of his son, is awarded annually to a senior student for the best examination in chemistry.

Allie S. Freed Prize.—This prize of \$40, established in 1957 by Mrs. Allie S. Freed, is awarded annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Preventive Medicine.

Charles Glover Prize.—This prize, established in 1957 by Charles Carroll Glover, Jr., a Trustee of the University, in memory of his great-grandfather, Charles Glover, an illustrious member of the bar of the District of Columbia, consists of selected law books and is awarded annually to the student in the Law School who has attained the highest average grade in the third-year, full-time course.

Alice Douglas Goddard Prize.—This prize of \$75 was established in 1941 by Frederick Joseph Goddard of Georgetown, D. C., in memory of

Alice Douglas Goddard, and is awarded annually to the upper division student making the highest average in American literature.

Edward Carrington Goddard Prize.—This prize of \$75 was established in 1923 by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D. C., in memory of Edward Carrington Goddard, class of '81, and is awarded to the junior or senior student making the highest average in the French language and literature.

James Douglas Goddard Prize.—This prize of \$75 was established in 1923 by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D. C., in memory of James Douglas Goddard, class of '01, and is awarded to the senior student making the highest average in pharmacy.

Morgan Richardson Goddard Prize.—This prize of \$75 was established in 1923 by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D. C., in memory of Morgan Richardson Goddard, and is awarded to the junior or senior student making the highest average in the following fields: economics, business administration, foreign commerce, and public accounting.

Alec Horwitz Prize.—This prize of \$100, established in 1959 by Dr. Alec Horwitz, is awarded annually to a senior in the School of Medicine who has demonstrated exceptional proficiency in the field of surgery.

Gardiner G. Hubbard Memorial Prize in United States History.—This prize of \$60 was established by Mrs. Gertrude M. Hubbard in memory of her husband, the late Gardiner G. Hubbard, and is awarded annually to that member of the graduating class majoring in history who has maintained the highest standing in courses in United States history.

Kappa Beta Pi Prize.—Eta Alumnae Chapter of Kappa Beta Pi Legal Sorority offers an annual prize which consists of a copy of Blackstone's *Commentaries* or a legal dictionary to be awarded to the woman law student in the freshman class who attains the highest average for the freshman year.

Kappa Kappa Gamma Prize.—Kappa Kappa Gamma Sorority offers annually a prize of \$10 to the full-time freshman who achieves the best record in Botany 1-2.

John Bell Larner Prize.—This prize, established by the bequest of John Bell Larner, consists of a medal which is awarded annually to that member of the graduating class in the Law School who attains the highest average grade in the entire course for the degree of Bachelor of Laws or Juris Doctor.

Huron W. Lawson Prize.—This prize of \$100, established in 1957 by Mrs. Huron W. Lawson in memory of her husband, Dr. Huron W. Lawson, who was a distinguished member of the Medical Staff of The George Washington University, is presented annually to a member of the

graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Obstetrics and Gynecology.

Martin Mahler Prize in Materials Testing.—This prize, established in 1953 by Martin Mahler, consists of a one-year membership in the American Society for Testing Materials and is awarded to the upper division or graduate student in engineering who submits the best reports on tests in the Materials Laboratories course with preference given to prestressed concrete tests.

Mortar Board Prize.—This prize, consisting of a silver cup, is awarded annually to the woman student in the sophomore class having a scholarship average of B or higher and the most outstanding record in activities.

Julius S. Neviasser Prize in Orthopedic Surgery.—This prize of \$100, established in 1956 by Dr. Julius S. Neviasser, is awarded annually to the student in the junior class of the School of Medicine who scores the highest grade in a written examination in Orthopedics.

Omicron Delta Kappa Prize.—Alpha Delta Circle of Omicron Delta Kappa Fraternity offers annually a plaque to be awarded to "that member of the senior class who throughout his course has done the most constructive work in the furtherance and upbuilding of the University student activities".

John Ordronaux Prizes.—These prizes were established in 1909 by the bequest of John Ordronaux.

The amount of \$140 is awarded to the member of the graduating class in the School of Medicine who has the highest scholastic standing.

The amount of \$70 is awarded annually to the student in the Law School who has attained the highest average grade in the first-year, full-time course; and \$70 to the student who has attained the highest average grade in the second-year, full-time course.

Phi Delta Kappa Prize.—This prize, established in 1956 by Beta Gamma Chapter of Phi Delta Kappa, consists of a \$50 United States Government Savings Bond and is presented annually to the outstanding senior man in the teacher education program in the School of Education.

Phi Eta Sigma Prize.—The George Washington University Chapter of Phi Eta Sigma offers annually to the male student attaining the highest scholastic average in his first full semester of work, a choice book selected from the field of the recipient's major interest. The winner's name will be engraved on a plaque in the Office of the Dean of the Junior College.

Pi Beta Phi Prize.—A prize of \$20 is awarded annually by the District of Columbia Alpha Chapter of Pi Beta Phi Fraternity to that woman member of the senior class who throughout her college course has done the most constructive work in the promotion of student activities among the women of the University.

Pi Lambda Theta Prize.—This prize, established in 1956 by Alpha Theta Chapter of Pi Lambda Theta, consists of a \$50 United States Gov-

ernment Savings Bond and is presented annually to the outstanding senior woman in the teacher education program in the School of Education.

Psi Chi Prizes.—The George Washington University Chapter of Psi Chi, national honorary society in psychology, offers annually two awards in the field of psychology; the first, \$25 to the best undergraduate student in Experimental Psychology; the second, \$25 to the graduate student submitting the best Master's thesis in Psychology.

Ruggles Prize.—The Ruggles Prize of \$35, established by Professor William Ruggles in 1859, is awarded annually to a candidate for a baccalaureate degree for excellence in mathematics.

Sigma Kappa Prize.—Zeta Chapter of Sigma Kappa Sorority offers an annual prize of \$10 to the student with the highest grade in the final examination in General Chemistry.

Sigma Tau Prize.—Xi Chapter of Sigma Tau Fraternity offers annually a medal to be awarded to that member of the freshman class in the School of Engineering who maintains the highest scholastic standing in the work of the entire year.

Society of Colonial Wars in the District of Columbia Prize.—This award, in the form of a gold medal, established in 1953 by the Society of Colonial Wars in the District of Columbia, is to be awarded to a candidate for a graduate degree who, in the judgment of the Faculty of the Department of History, submits a thesis or dissertation demonstrating excellence in historical research in American Colonial history. The University reserves the right to withhold the award if no thesis or dissertation attaining the required degree of excellence is submitted.

Staughton Prize.—The Staughton Prize of \$30, established by the Reverend Romeo Elton, is awarded annually to the student making the best record in the most advanced course in the Latin language and literature.

James MacBride Sterrett, Jr., Prize.—This prize, established in 1911 by Professor James MacBride Sterrett in memory of his son, consists of the *American Institute of Physics Handbook* awarded annually to that student who obtains the highest average in Physics 14, 15, and 16.

Charles Clinton Swisher Historical Club Prize.—This prize of \$100, established in 1936 by the Charles Clinton Swisher Historical Club and augmented in 1941 by the bequest of Professor Charles Clinton Swisher, is awarded annually to the student who submits the best essay covering some phase of medieval history.

Theta Tau Activities Plaque.—Gamma Beta Chapter of Theta Tau Fraternity offers annually a plaque to be awarded to that member of the senior class who has the most outstanding record in activities in the School of Engineering during the entire period of his attendance.

Thomas F. Walsh Prize.—This prize of \$150, established in 1901 by Thomas F. Walsh, is awarded annually to that student who submits the best essay in Irish history.

Washington Personnel Association Prize.—The Washington Personnel Association awards annually a certificate and \$25 to an outstanding graduating senior in business administration who shows general excellence in studies, demonstrates superiority in one of more courses in personnel administration, and shows qualities of leadership or promise through extra-scholastic activities.

Alexander Wilbourn Weddell Prize.—This prize of \$350, established in 1923, by Mrs. Virginia Chase Weddell, is awarded annually to a candidate for a degree who writes the best essay on the subject of "the promotion of peace among the nations of the world." The prize essays shall become the property of the University and shall not be printed or published without the written consent of the University. The University reserves the right to withhold the award if no essay attaining the required degree of excellence is submitted.

Zeta Tau Alpha Prize.—This prize of \$25, established in 1957 by the Beta Alpha Chapter of the Zeta Tau Alpha Fraternity, is to be awarded to the outstanding senior woman student in sociology.

MILITARY AWARDS

Society of American Military Engineers Gold Medal.—This medal, offered by the Society of American Military Engineers, is awarded annually to selected Air Force ROTC cadets in the next-to-last year of their engineering course and in the last year of such course. Nominations are made jointly by the Professor of Air Science and the Dean of the School of Engineering, and final selection is made nationally by a board of three senior Air Force officers.

National Defense Transportation Association Award.—This medal, offered by the National Defense Transportation Association, is awarded to the outstanding senior graduate who qualifies for the Air Force Specialty of Air Transportation Officer or Surface Transportation Officer. The award is given in recognition of leadership qualities, academic standing, aptitude for military service, and for meritorious achievement in furthering the aims and objectives of the Association in the promotion of preparedness for national defense.

Armed Forces Communications and Electronics Association Gold Medal.—These medals, offered by the Armed Forces Communications and Electronics Association, are awarded annually to outstanding senior Air Force ROTC cadets majoring in Electrical Engineering who demonstrate outstanding qualities of military leadership and distinguish themselves either academically or by leadership in campus activities.

Air Force Association Silver ROTC Medal.—This medal, offered by the Air Force Association, is awarded annually to that cadet, who, after completion of Air Force ROTC summer training, is judged to be the outstanding cadet among those who have indicated their intention to apply for flying training upon graduation.

Reserve Officers' Association Medals.—Gold, silver, and bronze medals, offered by the Reserve Officers' Association of the District of Columbia, are awarded annually to those cadets enrolled in Air Science 101 and 102, 51 and 52, 21 and 22, respectively, who receive the highest grades for the current year in the leadership and academic phases of the Air Force ROTC course.

Chicago Tribune Gold ROTC Medal.—This medal, offered by *The Chicago Tribune*, is awarded each semester to that cadet enrolled in Air Science 151-52 who has made an outstanding contribution to the effectiveness of the Air Force ROTC program by demonstrating the highest ideals of leadership and scholastic excellence.

Chicago Tribune Silver ROTC Medal.—This medal, offered by *The Chicago Tribune*, is awarded each semester to that cadet of the Air Force ROTC Basic Course who has demonstrated outstanding leadership potential and who has maintained excellent scholastic standing in the University.

Sons of the American Revolution ROTC Medal.—This medal, offered by the District of Columbia Society, Sons of the American Revolution, is awarded annually to that freshman cadet of each Air Force ROTC flight who demonstrates to the maximum degree traits and qualities of good citizenship and meets the prescribed requirements established by the donor.

Unit Leadership Trophy.—This silver trophy, offered by Walter G. Bryte, Jr., Colonel, USAF (Retired), first Professor of Air Science at this University, is awarded annually to the Air Force ROTC flight adjudged best in a competitive review and inspection. The Cadet Commander of this flight is presented a set of engraved Second Lieutenant's insignia.

The Colonial Cadet Rifle Trophy.—This trophy, offered by Master Sergeant Jerome Gleason, USAF, first coach of the Air Force ROTC Rifle Team at this University, is awarded to that cadet who is judged to be the outstanding member of the rifle team.

Arnold Air Society Scroll.—This scroll, offered by the Carl Spaatz Squadron of the Arnold Air Society, is awarded annually to the outstanding cadet completing the basic course with a cumulative average of B or better in Air Force ROTC courses.

Pershing Rifles Gold, Silver, and Bronze Achievement Medals.—These medals are awarded annually by the National Headquarters to those Air Force ROTC cadets who are Pershing Riflemen and who are judged to be outstanding examples of the ideals of the Pershing Rifles.

Republic Aviation Award.—An engraved identification bracelet, offered by the Republic Aviation Corporation, is awarded annually to that cadet enrolled in Air Science 101 and 102 who, in competition, makes the most effective verbal presentation on the Air Power theme.

The Convair Award.—A Convair miniature airplane, offered by the Consolidated Vultee Aircraft Corporation is awarded annually to that

cadet enrolled in Air Science 51 and 52 who achieves the highest cumulative grade in the basic course and who applies for flight training.

Reserve Officers' Association Junior Memberships.—Five junior memberships, offered by the Reserve Officers' Association of the District of Columbia, are awarded annually to the five Air Force ROTC cadets who obtain the highest grades in Air Science 101 and 102.

National Rifle Association Club Champion Medal.—This medal, offered by the National Rifle Association, is awarded to a sophomore, junior, or senior member of the Air Force ROTC Rifle team judged to be the outstanding member of the team based on marksmanship, participation in team matches, and contribution to the effectiveness of the team.

National Rifle Association Qualification Medals.—These medals, offered by the National Rifle Association, are awarded annually to members of the Air Force ROTC Rifle team qualifying as Expert, Sharpshooter, or Marksman in indoor rifle firing.

Air Force ROTC Rifle Team Awards.—Trophies, plaques, and medals are awarded annually to Air Force ROTC Rifle Teams through successful competition in the following:

- The Air Force ROTC Liaison Area Championship Matches
- The Army and Area Intercollegiate and Interscholastic Matches
- The Secretary of the Air Force ROTC Rifle Match
- The William Randolph Hearst National ROTC Rifle Matches.

FINANCIAL AID

STUDENT EMPLOYMENT

Graduate and undergraduate student assistantships are available in several departments of the University. Application should be made to the executive officer of the department of instruction concerned.

The Placement Office maintains a registry of positions available in many fields of work and refers qualified applicants for consideration.

LOAN FUNDS

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Students in the schools of Law, Medicine, and Pharmacy should direct inquiries to and file applications with their respective deans. All other inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of The George Washington University have made available a fund for short-term loans to students to provide for partial payment of tuition. Applications for these loans shall be made three days prior to the dates on which tuition installments are due.

Joseph H. Himes Loan Fund.—This fund contributed by Joseph H.

Himes, in the amount of \$17,306.53, is available for loans to students in the School of Medicine.

Home Economics Loan Fund.—This fund of \$382.35, contributed by the D. C. Home Economics Association, is available for loans to senior girls majoring in Home Economics.

Kellogg Medical School Loan Fund.—The W. K. Kellogg Foundation in Battle Creek, Michigan, has established a fund of \$20,852.43 for loans to students in the School of Medicine.

Law Association Loan Fund.—The George Washington Law Association has established a loan fund in the amount of \$2,527.64 for loans to students in the Law School requiring less than thirty semester hours credit toward the degrees of Bachelor of Laws or Juris Doctor.

School of Medicine Loan Fund.—This fund of \$12,667.62, contributed by medical students, is available for loans to students in the School of Medicine.

National Defense Student Loan Fund.—This fund is available to full time undergraduate and graduate students who are in need of financial assistance. Priority is given those applicants who express a desire to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than August first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

Pfizer Medical School Loan Fund.—Chas. Pfizer & Co., Inc., has established a fund of \$1,046.61 for loans to students in the School of Medicine.

Benjamin Schoenfeld Memorial Pharmacy Loan Fund.—This fund, established by the family and friends of Benjamin Schoenfeld, in the amount of \$2,076.59, is available for loans to students studying pharmacy.

Sutherland Medical School Loan Fund.—This fund, in the amount of \$1,634.82 and established by Mrs. Rose L. Sutherland, is available for loans to students in the School of Medicine.

REGULATIONS

A student enrolled in the University is required to conform to the following University regulations and to comply with the rules and regulations of the college, school, or division in which he is registered.

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return.

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration in any unit of the University.

ATTENDANCE

A student may not attend classes until registration has been completed and fees due have been paid. Regular attendance is required. A student may be dropped from any course for undue absence.

A student suspended for any cause may not attend classes during the period of suspension.

SCHOLARSHIP REQUIREMENTS

A student who fails to maintain the scholarship requirements of the college, school, or division in which he is registered may be dismissed from the University.

GRADES

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors.

Undergraduate.—The following grading system is used: *A*, excellent; *B*, good; *C*, average; *D*, passing; *F*, failing. Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the Dean's Council of the college, school, or division concerned. Courses from which a student has withdrawn by proper authorization will be indicated by the symbol *W*. A student may not repeat for grade a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar.

Graduate.—For graduate work, grades are indicated as *E* (excellent), *S* (satisfactory), *U* (unsatisfactory).

For the grading systems of the School of Medicine and the Law School, see the explanations in the announcements of those schools.

THE QUALITY-POINT INDEX

Undergraduate.—Scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on the complete collegiate record in this University.

Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered. Courses marked *W* or *I* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded, or at the close of a calendar year, whichever occurs first. If an "incomplete" is not superseded by a proper grade within the allotted time, it is computed as zero quality points. Grades in courses taken at another institution are not considered in computing the quality-point index.

EXAMINATIONS

Examinations are scheduled at the end of each semester or at the completion of the course.

ACADEMIC DISHONESTY

Evidence of dishonesty on the part of any student will result in his suspension from the University upon the recommendation of the appropriate dean's council.

A student found guilty of dishonesty will be deprived of credit for all courses in the semester during which the dishonest act occurs.

A student may apply to be readmitted to the University in the semester or summer session which begins next after an interval of one year from the date of suspension.

WITHDRAWAL

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the dean of the college, school, or division in which the student is registered. Permission to withdraw from the University will not be granted a student who does not have a clear financial record. (See "Fees and Financial Regulations", page 30.)

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases. (See

* The University work week is Monday through Friday, inclusive.

pages 130-31 for regulations governing withdrawal from the School of Engineering.)

All charges for courses dropped without the approval of the dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

A student may not withdraw from either the basic course or the advanced course of the Air Force ROTC without the approval of the President of the University.

CHANGES IN PROGRAM OF STUDIES

Changes within a College, School, or Division.—A student may not change or drop courses (see "withdrawals", above) or change his status to that of auditor except with the approval of the dean of the college, school, or division in which he is registered.

Change from one section to another of the same course may be made with the approval of the dean and the department concerned.

Change from one major subject to another within the same college or school may be made with the approval of the dean. All requirements specified in the course of study to which the change is made must be satisfied.

Transfer within the University.—Transfer from one college, school, or division to another may be made only with the approval of the deans concerned. Except in cases of normal progression from the Junior College to Columbian College or the School of Government in a regular four-year program, application for transfer must be made to the Director of Admissions on the proper form provided by his office.

Students wishing to transfer from the Division of University Students or the Division of Special Students to a degree-granting college or school of the University should note that a maximum of 45 semester hours will be accepted in transfer.

In order to provide degree candidates with proper academic counsel and the benefits of integrated programs of study, the faculties of the various schools and colleges have established minimum residence requirements and regulations with regard to supervision of the work done in the student's major field. In addition, various special regulations regarding course sequence, selection of electives, and advisory approval of programs apply in particular curricula. Students transferring within the University are advised to study carefully the graduation requirements on pages 56-58 and to note that in all undergraduate divisions, except the Junior College and the College of General Studies, 30 semester hours, including at least 12 semester hours in the major field, must be completed in residence in the school or college from which the degree is sought. Upon transfer the student should consult the dean concerned and under-

stand clearly the requirements he must fulfill. (For residence requirements in the Junior College, see page 67. For information concerning the College of General Studies, see separate bulletin.)

CREDIT

Credit toward a degree is given only after regular registration for and satisfactory completion of the required work of classes in the University, or upon the granting of advanced standing in accordance with the regulations of the several colleges, schools, and divisions.

On request the Registrar will issue to the student a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations.

TRANSCRIPTS OF RECORD

Official transcripts of student records will be forwarded on request to other institutions. Unofficial copies of records will be issued to the student on request. No charge is made for the first copy; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a student who does not have a clear financial record.

SUMMER SCHOOL CREDIT

A student who plans to attend summer school sessions at another institution with the intention of having credits so obtained apply toward graduation from this University must first secure the written approval of the dean of his college or school. In no event will such credits be recognized to an amount in excess of that which might be earned in a similar period in this institution.

PHYSICAL EDUCATION REQUIREMENTS

Students in the Junior College and freshmen and sophomores in the School of Engineering are required to take Physical Education 1-2 and 11-12 unless they are registered for less than 9 semester hours or unless regular employment during the day makes it necessary to take all classes during the evening hours. Air Force ROTC cadets and a limited number of freshman and sophomore women may substitute Air Science 1-2 and 11-12 for the physical education requirement.

Any other exemptions will be granted only upon written petition which has been recommended by the physical education department concerned and approved by the dean of the college or school in which the student is registered.

Junior College students exempt from the physical education requirement will be required to substitute four hours of elective.

A student entering the University with advanced standing is not exempt from the physical education requirements unless he has satisfactorily met the requirements elsewhere.

The required medical and physical examinations, as specified by the departments of physical education, will be arranged at the time of registration.

GRADUATION REQUIREMENTS

To be recommended by the Faculty for graduation a student must have met the admission requirements of the college or school in which he is registered, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—It is the student's responsibility to file an application for graduation in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Scholarship.—In all undergraduate divisions of the University the scholarship requirement for graduation is a quality-point index of at least 2.00.

The graduate student must meet the scholarship requirements for the particular degree for which he is registered.

Curriculum.—Minimum curriculum requirements for each degree are stated under the college or school offering work in preparation for the degree. (For Air Force ROTC graduation requirements see the Department of Air Science.)

Residence.—Unless otherwise specified, in all undergraduate divisions of the University, *a minimum of thirty semester hours, including at least twelve hours in the major field, must be completed in residence in the school or college from which the degree is sought.* This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the dean of the college or school concerned to pursue work elsewhere, the work of the senior or final year must be completed in residence.

The graduate student must meet the residence requirements for the particular degree for which he is registered.

With the permission of the dean of the college or school concerned, a student may be granted leave of absence; such student should, however, remain technically in residence by paying the residence fee for each semester he is absent. For the purpose of this regulation, the summer session will be disregarded.

The student who has completed his tuition requirements, but whose

graduation is deferred because of failure to submit an acceptable thesis, failure to pass the comprehensive examination, or for any other reason, must maintain "in residence" status by paying the residence fee for the semester or summer session immediately preceding the graduation at which he expects to receive his degree.

Graduate Record Examination.—All candidates for Bachelor's degrees in Columbian College, the School of Engineering, the School of Government, and the College of General Studies are required to take two parts of the Graduate Record Examination in the University's institutional testing program. The examinations are conducted by the University twice a year: the Fall Testing Session (December 10, 1960) for seniors graduating in February, and the Spring Session (April 8, 1961) for those graduating in June or October. Dates of the examinations are announced in the *Schedule of Classes*.

Each senior required to take the Graduate Record Examination must register for it in the office of his dean when he registers for his final regular semester of study (excluding summer sessions). A \$10 examination fee is payable at the time of registration.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. By special permission seniors who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

See the announcements of the various schools and colleges in this CATALOGUE for a description of the tests required.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for the Master's degrees, the degree of Doctor of Education, the degree of Doctor of Juridical Science, the degree of Doctor of Business Administration, the degree of Doctor of Philosophy, or the degree of Doctor of Science must be presented in its final form to the dean of the college or school concerned no later than the date specified in the University calendar. Three complete copies of each are required. It is the responsibility of the candidate for a graduate degree to obtain from his dean a printed copy of the regulations governing the styling and reproduction of theses and dissertations, which are rigidly enforced.

Accepted theses or dissertations, with accompanying drawings, become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the appropriate dean.

Presence at Graduation.—A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the dean of his college or school.

HONORS

With distinction.—In all undergraduate divisions of the University the degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

In the School of Medicine and the Law School, degrees may be conferred "with distinction", at the discretion of the Faculty, on those students who attain an average of *A* on all work taken for the degrees.

Special honors.—Special honors may be awarded by the Faculty to any member of the graduating class for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.
2. The student must meet such other conditions as may be set at the time his candidacy is approved.
3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.
4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

Military honors.—An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Cadet" if he (1) has completed Air Science 101 and 102 with an academic standing among the upper third of the students enrolled therein; (2) has an accumulative academic average of *B* or better; (3) possesses high moral character and definite aptitude for service in the Air Force; (4) has distinguished himself by demonstrated leadership through participation in recognized extracurricular activities and while in attendance at an Air Force ROTC Summer Training Unit. A "Distinguished Air Force ROTC Cadet" is authorized to wear a "Distinguished Cadet" badge above the right breast pocket in the uniform. He may submit an application for a regular commission in the United States Air Force, which is given final consideration upon his designation as a "Distinguished Air Force ROTC Graduate."

An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Graduate" if he has (1) been designated a "Distinguished Air Force ROTC Cadet" and maintained the standards required of a "Distinguished Air Force ROTC Cadet" during the period between des-

ignation and graduation; (2) completed the Air Force ROTC Advanced Course; and (3) completed the requirements for a Bachelor's degree. A "Distinguished Air Force ROTC Graduate" will be presented with a certificate signed by the Commandant, Air Force ROTC, and, if he made application, will be considered for a regular commission in the United States Air Force.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card, issued upon the payment of fees, must be presented as identification.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

On the subject of the American Medical Association, it is interesting to note that the organization has been in existence for over 70 years. It was founded in 1847 by a group of physicians who were dissatisfied with the medical education and practice of the time. The association has since grown to become one of the largest and most influential organizations in the medical profession. It has been instrumental in the development of medical education, the regulation of the medical profession, and the advancement of medical research. The association has also been a strong advocate for the public health and the welfare of the patient. Its efforts have been directed towards the improvement of the medical profession and the betterment of the human condition. The association has a long and distinguished history, and it continues to play a vital role in the medical profession today.

RIGHT TO DIE
The right to die is a subject that has long been debated. It is a subject that touches upon the most fundamental principles of human rights and the sanctity of life. The question of the right to die is a complex one, and it has been the subject of much controversy. Some people believe that every human being has the right to die, just as they have the right to live. They argue that the right to die is a natural right, and it should be protected by the law. Others, however, believe that the right to die is a privilege, and it should be granted only in certain circumstances. They argue that the right to die is a luxury that only the wealthy can afford, and it is not a right that should be granted to all. The question of the right to die is a difficult one to answer, and it is one that will continue to be debated for many years to come.

THE JEWELL COLLEGE

THE COLLEGE AND THE DIVISIONS

THE COLLEGES, SCHOOLS, AND DIVISIONS

THE COLLEGE, SCHOOLS, AND DIVISIONS

THE JUNIOR COLLEGE

THE FACULTY AND STAFF OF INSTRUCTION*

G. M. Koehl, *Dean*; W. L. Turner, *Assistant Dean*

Professors R. H. Atwell, C. W. Bliven, P. W. Bowman, J. W. Brewer, H. F. Bright, A. E. Burns, Elizabeth Burtner†, R. D. Campbell, J. H. Coberly, C. W. Cole, R. H. Davison‡, D. C. Faith, C. E. Gauss, H. L. Geisert, Wood Gray, I. B. Hansen, Thelma Hunt, Herbert Jehle, F. E. Johnston, E. L. Kayser, R. D. Kennedy, Frances Kirkpatrick, D. C. Kline, G. M. Koehl, J. H. Krupa§, J. F. Latimer, H. B. Lawrence, L. P. Leggette, W. K. Legner, C. D. Linton, G. E. McSpadden, F. M. Mears, H. M. Merriman, R. H. Moore, E. E. Mortensen, W. H. Myers, C. R. Naeser, N. D. Nelson, C. W. Pettit, M. I. Protzman, W. F. Sager, R. P. Schlabach, Jr., E. S. Shepard, Lewis Slack, R. B. Stevens, Geza Teleki, K. M. Towne, F. S. Tupper, B. D. Van Evera, R. C. Vincent, W. R. West, R. E. Wood, S. N. Wrenn; *Associate Professors* J. G. Allee, Jr., L. S. Bielski, W. E. Caldwell, W. G. Clubb, V. J. DeAngelis, A. H. Desmond, R. G. Hanken, J. W. Harkness, R. C. Haskett, G. F. Henigan, Jr., P. H. Highfill, Jr.¶, H. H. Hobbs, F. C. Kurtz, C. B. Lavell, H. L. LeBlanc, L. P. Leite, T. P. G. Liverman, G. E. Mazzeo, M. H. McClanahan, C. Y. Meade, S. C. Munson, C. E. Olmstead, T. P. Perros, J. P. Reesing, Jr., J. W. Robb, G. L. Rogers†, William Schmidt, Wilson Schmidt†, M. H. Shott, R. W. Stephens, E. L. Stevens, Rafael Supervia, R. B. Thompson, W. L. Turner, C. E. Tuthill#, R. D. Walk, R. H. Walker, Jr., H. W. Westermann, D. G. White†, R. C. Willson, H. B. Yakobson; *Assistant Professors* R. E. Baker, W. E. Benson, J. M. Campbell, G. E. Cheney, C. J. Craig, Percy Crosby, J. T. Davis, R. E. Gajdusek, L. H. George, N. C. Hollbach, E. M. Johnson, R. G. Jones, J. C. King, Carlos Lozano, H. R. Ludden, J. L. Metivier, Jr., E. E. Pantzer III, E. E. Pontius, Jr., C. R. St. Cyr, G. A. Santangelo, R. H. Schlagel, J. W. Skinner, W. A. Smith, P. H. Stacy, L. M. Stallings, P. C. Steele, J. G. Sweeney, N. M. Tischler, R. Z. Vause, E. T. Wright, S. S. Yeandle; *Instructors* M. C. Ethier, M. W. Montzka, C. S. Vaughn

* The President of the University, the Dean of Faculties, the Dean and Assistant Dean of the College, the Registrar of the University, the Director of Admissions of the University, the Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty. This listing of Faculty and Staff of Instruction is for the academic year 1959-60.

† On sabbatical leave spring semester 1959-60.

‡ On leave of absence spring semester 1959-60.

§ On sabbatical leave fall semester 1959-60.

¶ On sabbatical leave 1959-60.

On leave of absence 1959-60.

COMMITTEES*

THE DEAN'S COUNCIL†

1961: J. W. Robb, R. B. Thompson; 1962: T. P. Perros, R. W. Stephens;
1963: W. E. Caldwell, F. M. Mears

COMMITTEE ON ADMISSION AND ADVANCED STANDING

J. W. Harkness (*Chairman*), W. G. Clubb, M. W. Montzka, W. A. Smith, R. C. Willson

COMMITTEE ON SCHOLARSHIP

W. L. Turner (*Chairman*), W. E. Benson, R. G. Hanken, M. H. McClanahan, J. L. Metivier, Jr., E. E. Mortensen, R. C. Vincent

JUNIOR COLLEGE ADVISORY COMMITTEE

G. M. Koehl (*Chairman*), R. E. Baker, W. E. Benson, C. W. Bliven, Frances Kirkpatrick, J. H. Krupa, C. R. St. Cyr, M. H. Shott, L. M. Stallings, R. W. Stephens, W. L. Turner, R. C. Vincent

GENERAL INFORMATION

INTRODUCTORY

The Junior College, which administers the first two years of the standard four-year college program in the liberal arts and sciences, was established in 1930, as a part of the academic reorganization of the University. Prior to 1930, the four-year program had been administered by Columbian College since its organization in 1821.

The Junior College curricula continue the studies of a general cultural nature begun in the secondary schools, and lay a foundation for the more specialized work which is to follow. Emphasis is accordingly laid (1) upon the social, cultural, biological, and physical background of civilization and (2) upon the discipline necessary to the effective prosecution of more advanced work.

The curricula offered in preparation for admission to Columbian College prepare students for advanced work in the fields of arts and letters and in science. They also serve as the first two years of the prelegal and premedical programs. The curriculum in Science meets the requirements for the first two years of the Bachelor of Science in Medical Technology curriculum offered by Columbian College in collaboration with the Department of Pathology and the University Hospital.

The Junior College also provides the preprofessional work required for admission to the schools of Pharmacy, Education, and Government.

In addition it provides the following two-year curricula in vocational

* The Dean of the Junior College is a member ex officio of all committees.

† Elected by the Faculty.

training: Accounting, Home Economics, Physical Sciences, and Secretarial Studies.

ADVISORY SYSTEM

In order that students may have opportunities for assistance in planning their courses and also for obtaining personal, educational, and vocational advice in every phase of their academic work during the first two years, a number of members of the Faculty serve as advisers to Junior College students.

Members of the Faculty, selected for their knowledge of Junior College requirements and student programs, advise students in making up their programs of study for each semester. A separate staff of experienced advisers under the chairmanship of the Dean assists those students who find it difficult to make adjustments to college life because of scholastic or other reasons. Students who are "warned" or who are on probation may be required to consult these advisers at regular intervals. Students are encouraged to consult any member of the Advisory Staff or their instructors about college problems at any time.

Copies of notices of "warning" or probation will be sent to the parents or guardians of students on request, and the Dean and members of the Advisory Staff are available for consultation with parents or guardians concerning student problems.

REGULATIONS

Students in the Junior College are subject to, and are expected to familiarize themselves with, the regulations regarding ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 13-30, and the University regulations stated on pages 52-59.

SCHOLASTIC-APTITUDE TESTS

Students admitted to the Junior College may be required to take the scholastic-aptitude tests of the University.

REQUIRED PLACEMENT EXAMINATIONS

English.—Special placement examinations, required of all entering freshmen, will be conducted by the English Department. Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English IX.

Foreign Languages.—A standardized placement examination will be required of all entering students who wish to continue in college the language begun in high school (French, German, Russian, or Spanish). Upon completion of the examination assignment will be made to the appropriate

course with credit to be assigned on the usual basis. This does not apply to students whose previous experience in a given language is equivalent to two college years.

The Use of Correct English.—The use of correct English, oral or written, is required not only in English but also in all other courses (see page 83).

FIRST- AND SECOND-GROUP COURSES

A Junior College student may not take second-group courses (courses numbered 101–200) without the written permission of the instructor and of the Dean of the Junior College. A student will not be permitted to postpone a first-group course required under the curriculum for which he is registered in order to take a second-group course for elective credit. The principle that first-group courses must be taken in the Junior College years, and advanced courses in Columbian College and the professional schools, will be rigidly adhered to in approving student programs. No student on probation is permitted to take second-group courses except by the express permission of the Committee on Scholarship.

AMOUNT OF WORK

Sixteen or 17 semester hours constitute a normal academic load. A student not on probation may be permitted by the Dean to take 18 semester hours.

A student whose quality-point index is 3.50 may, with the permission of the Dean, take 19 or 20 semester hours. No student may take more than 20 hours, except with the permission of the Committee on Scholarship.

For an employed student working 20 or more hours a week, 10 semester hours constitute a normal academic load. An employed student not on probation may be permitted by the Dean to take 11 hours. An employed student whose quality-point index is 3.50 may be permitted by the Dean to take 13 or 14 hours.

A student previously unemployed who accepts employment subsequent to registration or at any time during a semester is required to report that fact immediately to the Dean and to bring his program within the limitations set by the Faculty upon the amount of work to be carried by an employed student.

ATTENDANCE

The student is held responsible to the instructor in charge of the course for which he is registered for all the work of the course, and all absences must be excused before provision will be made for him to make up the work missed.

With the exceptions noted below, occasional absences from a course not to exceed in number the semester hours of credit for the course, will be automatically excused. (If a course has distinct divisions such as lectures,

laboratories, recitations, etc., these excuses apply pro rata to such separate divisions.) In the application of this rule absences immediately preceding or following holiday periods are to be counted double.

A student on probation is allowed no automatic excuses.

Excuses for absences from two or more consecutive class periods, and for absences from examinations which have been announced in advance, can be obtained only by making written application to the instructor in charge of the course.

A student whose absences from any class, whether excused or unexcused, are in excess of one-fourth of the total number of class periods will receive the grade of *F* for the course, except by special ruling of the Dean on recommendation of the instructor in the course.

CLASSIFICATION OF STUDENTS

A student who has satisfactorily completed at least 32 semester hours of work including 18 hours in his curriculum requirements, is classed as a *sophomore*.

THE DEGREES

Upon the satisfactory completion of the requirements of the Junior College, the degree of Associate in Arts or Associate in Science is conferred.

REQUIREMENTS FOR THE DEGREES

RESIDENCE

The last 15 hours of work required for the Associate's degrees must be taken in residence in the Junior College.

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 52 and 53.

In order to receive the degree of Associate in Arts or Associate in Science a student must have a quality-point index of at least 2.00.

Honor Roll.—The name of every student who has a quality-point index of 3.50 or higher on the basis of his complete record at this University will be placed on the honor roll and published. No consideration is given to those who have completed a total of less than 15 semester hours. A place on the honor roll does not necessarily mean that the student will receive honors upon graduation.

Dean's List.—The name of every student who makes a quality-point index of 3.50 or higher on a minimum of 15 semester hours of work taken in any one semester will be placed on the Dean's List for that semester.

Probation.—A student must maintain a quality-point index of at least 2.00 to be in good academic standing.

A student who has attempted 12 or more semester hours of work and whose quality-point index is between 1.50 and 2.00 will be placed on probation. This probation extends over the period in which the student attempts 12 semester hours of work.

The student who has earned an average of 2.00 or below for work undertaken during this probationary period will be suspended. The student whose over-all quality-point index is still below 2.00, but whose average for work undertaken during the probationary period is above 2.00 may be continued on probation by the Committee on Scholarship.

Suspension.—A student whose quality-point index is below 1.50 is subject to suspension by the Committee on Scholarship.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. On application for readmission the student must submit specific evidence to the Committee on Scholarship that he is better qualified to pursue college work.

A student suspended twice for poor scholarship will not be readmitted.

Mid-semester Warning.—At the end of the seventh week of each semester, instructors file in the Office of the Junior College the names of those students who are doing work of *D* grade or lower. A notice of Warning is sent to the student and a copy filed with the appropriate adviser. A "warning" constitutes notice to the student that he must consult his instructor and adviser at the earliest opportunity.

CURRICULUM REQUIREMENTS

The satisfactory completion of 64 semester hours of college work is required, as outlined in one of the Junior College curricula described below.

Except for students intending to apply for the combined degrees of Bachelor of Arts and Doctor of Medicine or the degree of Bachelor of Science in Medical Technology, not more than 12 hours of professional courses may be included in the 124 hours required for the Bachelor's degrees in Columbian College. Junior College students electing professional courses under this rule must obtain the approval of the Dean of the Junior College before registering for these courses.

Physical Education Requirements.—Physical Education or Air Force ROTC Leadership Laboratory is required of all students in the freshman and sophomore years. (See "Physical Education Requirements", pages 55 and 56.)

Foreign Language Requirements.—In curricula requiring foreign languages a student must complete satisfactorily the equivalent of two years of college work in a single foreign language.

A student offering for admission four acceptable high school units of a single foreign language, or the equivalent, is not required to take any foreign language.

A student who offers less than four units and wishes to meet the Junior College requirement by continuing in the same language must take the language placement test (see pages 65-66).

In general, one year of high school language is considered to be equivalent to one semester of college language.

In some instances foreign languages are required or recommended as preparation for advanced work in Columbian College and the professional schools. The student should consult his adviser as to these requirements, so that appropriate foreign languages may be included, when necessary, in his Junior College program.

English Requirements.—Entering students registered in the pre-Columbian College curricula must follow the sequence of English 1, both halves of one of the introductory literature courses, and English 4. This does not apply to students transferring to these curricula or students registering in the preprofessional or vocational curricula.

JUNIOR COLLEGE CURRICULA

I. CURRICULA FOR ADMISSION TO COLUMBIAN COLLEGE AND THE PROFESSIONAL SCHOOLS

Each of the following curricula comprises the first two years of a standard four-year college course and prepares the student for upper division work.

All curricula in this group lead to the degree of Associate in Arts.

A. COLUMBIAN COLLEGE:

1. ARTS AND LETTERS

The following two-year curriculum prepares for the Bachelor of Arts program in Columbian College:

	Semester Hours
English Composition and Literature English 1; 51-52, 71-72, 91-92, Classical Lan- guages 71-72, French 51-52, German 51-52, Slavic Languages 91-92, or Spanish 51-52; English 4	12
Foreign Language ... See pages 68-69 for foreign language requirement	12
Physical Education ... See pages 55-56 for statement of requirement...	4
Science Biology 1-2; Botany 1-2; Chemistry 3-4, 11-12; Geology 1-2; Physics 11, 12; or Zoology 1-2...	6-8
Social Studies Economics 1-2; Geography 51, 52; History 39-40, 71-72; Political Science 1 and 9, 1 and 10, or 9-10; or Sociology and Anthropology 1-2....	6
Elective*	22 or 24
Total	64

*It is suggested that electives include one of the following courses: Art 31-32, 71-72; Philosophy 51-52, 111-12; Religion 9-10, 59-60.

The student should obtain the advice of his major department as to proper prerequisite and collateral courses for the intended major.

Credit is not given for courses elected in Secretarial Studies; credit may be given for a limited number of courses elected in Physical Education, with the approval of the Dean.

2. SCIENCE

The following two-year curriculum prepares for the Bachelor of Science and the Bachelor of Science in Medical Technology curricula in Columbian College:

	Semester Hours	
English Composition and Literature	English 1; 51-52, 71-72, 91-92, Classical Languages 71-72, French 51-52, German 51-52, Slavic Language 91-92, or Spanish 51-52; English 4.	12
Foreign Language	French, German, or Russian or nonscience elective	12
	NOTE.—A reading knowledge of French, German, or Russian is required. This may be satisfied by French 4, German 4, or Russian 4 or by special examination.	
Mathematics	Mathematics 3, 6, or electives	6
	NOTE.—The Mathematics 3 requirement may be satisfied by offering two years of high school algebra acceptable for admission; the Mathematics 6 requirement may be satisfied by offering one-half year of high school trigonometry acceptable for admission.	
Physical Education	See pages 55-56 for statement of requirement.	4
Science	(a) Biology 1-2, Botany 1-2, Zoology 1-2 †. (b) Chemistry 11-12, Geology 1-2, Physics 11 and 12 or 11 and 14.	18 to 22
	(In satisfying this requirement, at least one year-course must be taken in each group (a) and (b).)	
Social Studies	Economics 1-2; Geography 51, 52; History 39-40, 71-72; Political Science 1 and 9, 1 and 10, or 9-10; or Sociology and Anthropology 1-2	6
Elective*		2 to 6
Total		64

2. PREMEDICAL

The first 60 semester hours of the 90 required for admission to the School of Medicine are undertaken in the Junior College. Premedical students may follow either the Arts and Letters curriculum or the Science curriculum listed above. They should, however, note the specific requirements for admission to the School of Medicine. (See Admission, page 17.) Each premedical program must be approved by the Premedical Adviser.

* It is suggested that electives include one of the following courses: Art 31-32, 71-72; Philosophy 51-52, 111-12; Religion 9-10, 59-60.

The student should obtain the advice of his major department as to proper prerequisite and collateral courses for the intended major.

Credit is not given for courses elected in Secretarial Studies; credit may be given for a limited number of courses elected in Physical Education, with the approval of the Dean.

† Students enrolled in the Medical Technology program may add Bacteriology 112 to this group.

4. MEDICAL TECHNOLOGY

Candidates for the degree of Bachelor of Science in Medical Technology, offered by Columbian College in collaboration with the Department of Pathology and the University Hospital, should follow the Science curriculum in the Junior College, including specifically Chemistry 11-12, Zoology 1-2, and Bacteriology 112. See pages 112 and 113 for a description of the course and a statement of further requirements. Specific degree requirements are stated under the Department of Pathology following the listing of the Staff of Instruction.

B. SCHOOL OF PHARMACY:

1. FOUR-YEAR CURRICULUM

The following two-year curriculum prepares for the four-year Bachelor of Science in Pharmacy curriculum in the School of Pharmacy (see pages 149-50). Beginning April, 1960, only those students qualifying for second year standing in this curriculum, or who will qualify for such standing by September, 1960, and who expect to qualify for the degree before April, 1965, will be enrolled in the four-year curriculum.

Students planning to complete the requirements for the degree of Bachelor of Science in Pharmacy under the four-year curriculum within four years must complete 9 hours of approved elective in addition to the Junior College curriculum listed below. Some of this work may be completed during the fall and spring semesters; the remainder may be completed during a summer session.

	Semester Hours
English	English 1, 2
Science	Botany 1 or 2, Chemistry 11-12, Physics 11, 12, Zoology 1
	Chemistry 151-52
Social Studies	Economics 1
Professional Courses	Pharmacy 1-2, 23, 121-22, 125
Physical Education	See pages 55-56 for statement of requirement
Elective* .....	.....
Total	64

2. FIVE-YEAR CURRICULUM

The following two-year curriculum prepares for the five-year Bachelor of Science in Pharmacy curriculum (see pages 150-52) in

* It is suggested that electives include one of the following courses: Art 31-32, 71-72; Philosophy 51-52, 111-12; Religion 9-10, 59-60.
The student should obtain the advice of his major department as to proper prerequisite and collateral courses for the intended major.
Credit is not given for courses elected in Secretarial Studies; credit may be given for a limited number of courses elected in Physical Education, with the approval of the Dean.

the School of Pharmacy. Beginning April, 1960, students without previous college work will be enrolled in the five-year course. Those who have completed one or more years of college work may qualify for the four-year course.

	Semester Hours
English Composition and Literature English 1, 51-52, 71-72, 91-92; Classical Languages 71-72; French 51-52; German 51-52; Slavic Languages 91-92, or Spanish 51-52; English 4	12
Physical Education .. See pages 55-56 for statement of requirement...	4
Science Chemistry 11-12, 151-52; Physics 11, 12; Botany 1; Zoology 2.....	29
Social Studies Economics 1	3
Mathematics Mathematics 3 or elective.....	3
Professional Courses Pharmacy 1	1
Elective*	12
Total.....	64

C. SCHOOL OF EDUCATION:

1. EDUCATION

The following two-year curriculum prepares for the Bachelor of Arts in Education curriculum in the School of Education:

English	English 1, 2	6
	English 51-52, 71-72, or 91-92.....	6
Foreign Language ... (French, German, Latin, Russian, or Spanish.)	See pages 68-69 for foreign language requirement	12
Physical Education .. See pages 55-56 for statement of requirement...		4
Science and Mathematics	Two semesters to supplement senior high school courses, selected from: Biology 1-2; Botany 1-2; Chemistry 3-4, 11-12; Physics 11, 12; Zoology 1-2; or Mathematics 2 and 3, or 3 and 6, or 6 and 12	6 or 8
Social Studies	History 71-72	6
	Economics 1-2; Geography 51, 52; History 39-40; Political Science 1 and 9, 1 and 10, or 9-10; Religion 59-60; or Sociology and Anthropology 1-2. (Those offering for admission two or more acceptable senior high school units in the Social Studies may be exempted from this requirement)	6
Other Courses	Psychology 1	3
	Psychology 22	3
	Speech 1 or 11.....	3
	Statistics 53	3
Elective		4 to 6
Total.....		64

* Credit is not given for courses elected in Physical Education or Secretarial Studies.

2. HOME ECONOMICS

The following two-year curriculum prepares for the Bachelor of Science in Home Economics curriculum in the School of Education:

	Semester Hours
English English 1, 2	6
English English 51-52, 71-72; Speech 1-2, or 1 and 11..	6
Physical Education .. See pages 55-56 for statement of requirement...	4
Psychology Psychology 1, 29	6
Science Biology 1-2, Chemistry 11-12, Physics 11, 12...	6-8
Social Studies* Economics, History, Political Science, or Sociology and Anthropology	12
Major Prerequisites .. Home Economics 1, 22 (Freshman year).....	6
Academic Electives .. Home Economics 51, 62 (Sophomore year).....	6
Academic Electives .. (Freshman year)	6
Academic Electives .. (Sophomore year)	4-6
Total.....	64

3. PHYSICAL EDUCATION FOR MEN

The following two-year curriculum prepares for the Bachelor of Science in Physical Education curriculum in the School of Education:

English English 1, 2	6
Physical Education .. 1-2, 11-12	4
Science Biology 1-2 or Zoology 1-2 (Freshman year)...	6 or 8
Social Studies History 39-40, 71-72; Political Science 1 and 9, 1 and 10, or 9-10; or Sociology and Anthropology 1-2	12
Major Prerequisites .. Physical Education 43-44, 47; Speech 1 or 11 (Freshman year)	9
Physical Education 45-46, 49, 50, 58; Psychology 1, 22 (Sophomore year).....	18
Elective	7-9
Total.....	64

4. PHYSICAL EDUCATION FOR WOMEN

The following two-year curriculum prepares for the Bachelor of Science in Physical Education curriculum in the School of Education:

English English 1, 2.....	6
English English 51-52, 71-72, or 91-92.....	6
Physical Education .. 1-2, 11-12	4
Science Biology 1-2 or Zoology 1-2.....	6 or 8
Social Studies History 39-40, 71-72; Political Science 1 and 9, 1 and 10, or 9-10; or Sociology and Anthropology 1-2	6
Major Prerequisites .. Physical Education 43-44 (Freshman year)....	4
Physical Education 49, 50, 51-52; Psychology 1, 22 (Sophomore year).....	16
Academic Electives .. (Each year)	6 or 8
Total.....	64

* Courses are to be selected with the approval of the adviser in the Department of Home Economics.

D. SCHOOL OF GOVERNMENT:**1. ACCOUNTING AND BUSINESS ADMINISTRATION**

The following two-year curriculum prepares for the Bachelor of Arts in Government curricula in Accounting and in Business Administration in the School of Government:

	Semester Hours
Accounting Accounting 1-2	6
English English 1, 2, 11.....	9
Foreign Language ... See pages 68-69 for foreign language requirement	12
Physical Education .. See pages 55-56 for statement of requirement.....	4
Social Studies Economics 1-2; Political Science 1 and 9, 1 and 10, or 9-10.....	12
Speech Speech 1	3
Statistics Statistics 51, 52.....	6
Elective* (Students interested in Foreign Commerce include Geography 51).....	12
Total.....	64

2. FOREIGN AFFAIRS AND PUBLIC AFFAIRS

The following two-year curriculum prepares for the Bachelor of Arts in Government curricula in Foreign Affairs and Public Affairs in the School of Government:

English English 1, 2.....	6
Foreign Language ... See pages 68-69 for foreign language requirement	12
Mathematics, Science, Biology, Botany, Chemistry, Geology, Mathematics, Physics, Statistics, or Zoology.....	6 to 8
Physical Education .. See pages 55-56 for statement of requirement.....	4
Social Studies Economics 1-2; History 39-40, 71-72; Political Science 1 and 9, 1 and 10, or 9-10.....	24
Elective* (To satisfy minimum required credits. Students interested in Foreign Service include Geography 51)	10 to 12
Total.....	64

3. BUSINESS AND ECONOMIC STATISTICS

The following two-year curriculum prepares for the Bachelor of Arts in Government curriculum in Business and Economic Statistics in the School of Government:

Accounting Accounting 1-2	6
English English 1, 2.....	6
Foreign Language ... See pages 68-69 for foreign language requirement	12
Mathematics Mathematics 31 and prerequisites.....	4
Physical Education .. See pages 55-56 for statement of requirement.....	12
Social Studies Economics 1-2; Philosophy 51-52.....	3
Statistics Statistics 51 or 91.....	9
Elective*	
Total.....	64

* Credit is not given for courses elected in Physical Education or Secretarial Studies.

II. VOCATIONAL CURRICULA

In addition to the above curricula, all of which prepare for admission to upper division colleges and schools, the Junior College offers the following two-year terminal courses.

The curricula in Accounting and Secretarial Studies lead to the degree of Associate in Arts. The curricula in Home Economics and Physical Sciences lead to the degree of Associate in Science.

1. ACCOUNTING

The required work may be completed in two calendar years on a full-time basis or in three calendar years on a part-time basis, with the approval of the adviser.

	Semester Hours
Accounting Accounting 1-2, 101, 111, 121-22, 161, 171, 181, 191, 193	33
Business	
Administration Business Administration 131, 161, 162.....	9
Economics Economics 1-2	6
English English 1, 2	6
Physical Education .. See pages 55-56 for statement of requirement...	4
Elective To be selected with the approval of the adviser..	6
Total.....	64

2. HOME ECONOMICS

English	English 1, 2.....	6
	English 51-52, 71-72, 91-92, Russian 91-92; Speech 2 (1, 11)	6
	English 11 or Secretarial Studies 51.....	3
Home Economics	Home Economics 1, 22, 51, 62.....	12
Physical Education ..	See pages 55-56 for statement of requirement...	4
Psychology	Psychology 1	3
Secretarial Studies ..	Secretarial Studies 1, 2.....	6
Home Economics Elective*	.....	6-12
Elective* .....	.....	6-12
Total.....		64

3. PHYSICAL SCIENCES

This curriculum is designed for part-time students who do not wish to extend their collegiate education beyond 64 semester hours of work. All other students interested in the study of physical science should follow the pre-Columbian College Science curriculum.

Chemistry	Chemistry 11, 12, 21.....	12
English	English 1, 2, 11.....	9
Mathematics	Mathematics 3, 6, 12, 29, 30, 31.....	12-18

* Courses are to be selected with the approval of the adviser in the Department of Home Economics

	Semester Hours
Mechanical Engineering	2
Physical Education ..	4
Physics	15
Elective	4-10
Total.....	64

4. SECRETARIAL STUDIES

English	6
English 51-52, 71-72, 91-92, Russian 91-92....	6
Physical Education ..	4
Secretarial Studies* ..	24
Social Studies	6
Accounting	3
Speech	3
Elective	12
Total.....	64

Examinations for Waiving Curriculum Requirements†

A student desiring to omit a required course may take such examination as the department prescribes, and, on passing satisfactorily, he may be relieved of the curriculum requirements in that subject and may qualify for registration in an advanced course. Passing this examination does not entitle the student to any hours of credit toward the degree. A student desiring to take such examinations should make written request of the Dean and pay the required fee at the Office of the Treasurer before the date of the examination specified in the University calendar.

HONORS

The degree of Associate in Arts or Associate in Science may be conferred "with distinction" upon the student who has a quality-point index of 3.50 or higher, provided that student has been in residence at the University for 30 hours, 15 of which must have been taken in the Junior College at the time the index is calculated.

* Qualified students, upon the approval of the adviser or the satisfactory completion of a placement test, may waive Secretarial Studies 1, 11, and 12. Other courses, approved by the adviser, will be substituted.

† This provision does not apply to the premedical student, all of whose required premedical work must be taken in a recognized college of arts and sciences.

COLUMBIAN COLLEGE

THE FACULTY AND STAFF OF INSTRUCTION*

C. D. Linton, *Dean*; C. W. Pettit, *Assistant Dean*

Professors P. W. Bowman, J. W. Brewer, H. F. Bright, A. E. Burns, R. D. Campbell, J. H. Coberly, C. W. Cole, R. H. Davison†, Mitchell Dreese, C. E. Gauss, H. L. Geisert, Wood Gray, A. M. Griffin, I. B. Hansen, C. A. M. Hogben, Thelma Hunt, Herbert Jehle, E. H. Johnson, F. E. Johnston, E. L. Kayser, D. C. Kline, G. M. Kochl, W. H. Kraus, J. F. Latimer, C. E. Leese, L. P. Leggette, W. K. Legner, C. D. Linton, G. E. McSpadden, F. M. Mears, H. M. Merriman, R. H. Moore, E. E. Mortensen, C. R. Naeser, N. D. Nelson, C. W. Pettit, M. I. Protzman, W. F. Sager, R. P. Schlabach, Jr., E. S. Shepard, J. R. Sizoo, Lewis Slack, P. K. Smith, R. B. Stevens, Geza Teleki, I. R. Telford‡, F. S. Tupper, B. D. Van Evera, R. C. Vincent, D. S. Watson, W. R. West, R. E. Wood, S. N. Wrenn; *Associate Professors* E. C. Acheson, J. G. Allee, Jr., W. E. Caldwell, W. G. Clubb, W. C. Davis‡, A. H. Desmond, R. C. Haskett, G. F. Henigan, Jr., P. H. Highfill, Jr., H. H. Hobbs, J. W. Kendrick, C. B. Lavell, H. L. LeBlanc, L. P. Leite, T. P. G. Liverman, C. Y. Meade, J. N. Mosel, S. C. Munson, R. E. Murphy, C. E. Olmstead, T. P. Perros, J. P. Reesing, Jr., J. W. Robb, G. L. Rogers‡, William Schmidt, Wilson Schmidt‡, R. W. Stephens, E. L. Stevens, Rafael Supervia, R. B. Thompson, C. E. Tuthill§, R. D. Walk, R. H. Walker, Jr., H. W. Westermann, D. G. White‡, R. C. Willson, H. B. Yakobson; *Assistant Professors* J. M. Campbell, Percy Crosby, J. T. Davis, Rudolph Hugh, E. M. Johnson, R. G. Jones, J. C. King, Carlos Lozano, H. R. Ludden, W. L. Marsh, E. E. Pantzer III, J. L. Prather, R. H. Schlager, J. W. Skinner, W. A. Smith, R. Z. Vause

COMMITTEES#

THE DEAN'S COUNCIL**

1961: R. H. Davison, F. S. Tupper; 1962: A. H. Desmond, R. C. Vincent; 1963: G. L. Rogers, W. F. Sager

* The President of the University, the Dean of Faculties, the Dean of the College, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, and Assistant Professors constitute the Faculty.

† This listing of Faculty and Staff of Instruction is for the academic year 1959-60.

‡ On leave of absence spring semester 1959-60.

§ On sabbatical leave spring semester 1959-60.

|| On sabbatical leave 1959-60.

¶ On leave of absence 1959-60.

The Dean of Columbian College is a *membre ex officio* of all committees.

** Elected by the Faculty.

COMMITTEE ON ADMISSION AND ADVANCED STANDING

C. W. Pettit (*Chairman*), E. E. Mortensen (*Secretary*), C. W. Cole, J. W. Kendrick, W. F. Sager

COMMITTEE ON THE USE OF CORRECT ENGLISH

R. H. Moore (*Chairman*), J. G. Allee, Jr., G. F. Henigan, Jr., M. H. McClanahan, R. C. Willson

COMMITTEE ON SCHOLARSHIP

F. M. Mears (*Chairman*), W. G. Clubb, H. M. Merriman, J. P. Reesing, Jr., S. N. Wrenn

COMMITTEE ON STUDIES

C. D. Linton (*Chairman*), R. C. Haskett, E. E. Mortensen, William Schmidt, F. S. Tupper

GENERAL INFORMATION

INTRODUCTORY

Columbian College was founded in 1821. James Monroe, then President of the United States, aided in obtaining the charter from Congress which established "The Columbian College in the District of Columbia" for the "sole and exclusive purpose of educating youth in the English, learned and foreign languages, the liberal arts, sciences and literature", with full power to confer all degrees "usually granted and conferred in colleges".

In 1930, when the Junior College was established, the name "Columbian College" was bestowed upon the senior college of liberal arts.

THE COLUMBIAN COLLEGE PROGRAM

Columbian College is that branch of the University which grants the Bachelor's and Master's degrees in the liberal arts. Its purpose is to enable the student to develop harmoniously both his particular abilities and his general awareness as a human being. It demands of the student a thorough acquaintance with one major area of learning and at the same time an understanding of how that field of specialization fits into the larger context of the scientific, social, and moral problems which confront modern man. It stresses not merely expertness but that broadly enlightened expertness which encourages its graduates to grow through the years in ability and wisdom.

The program is a contemporary application of the historic liberal arts tradition. A particular vitality and meaning are imparted to it by the fact that The George Washington University is situated in the cosmopolitan capital city of a nation to which, increasingly, the world looks for leadership. Here, uniquely, the liberal arts tradition is put to the test of contact with reality.

REGULATIONS

Students in Columbian College are subject to, and are expected to familiarize themselves with, the regulations regarding ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 13-30, and the University regulations stated on pages 52-59.

PREREQUISITES

It is assumed that a student entering Columbian College has met the requirements of the Junior College under the *Arts and Letters* curriculum or the *Science* curriculum. (See the Junior College section of the CATALOGUE.) Following is a summary of these prerequisites:

The *Arts and Letters* curriculum: (1) English composition (6 semester hours) and an additional year course (6 semester hours) in English, American, European, Classical, or any other foreign literature. (2) Two college years (at least 12 semester hours) of a single foreign language or the equivalent (see foreign-language requirement, pages 68-69), are required. A transfer student who has had foreign-language courses in another institution meeting 4 or 5 times a week may have acquired as much as 12 semester hours in a foreign language without having taken four semesters (two full years). Such a student is required to take additional work here in the same language until he has completed four semesters (or an equivalent combination of high school years and college semesters). (3) At least one year (6 semester hours) in social studies, chosen from first-group courses in History, Political Science, Economics, Sociology and Anthropology, or Geography, is required. (4) At least one year (6 or 8 semester hours) of a laboratory science (Biology, Botany, Chemistry, Geology, Physics, or Zoology) is required.

The remaining hours of the Junior College program (roughly a minimum of 22 to 24 hours) should be devoted to the prerequisite courses required by the prospective major department (as stated following the departmental staff in the courses of instruction section of the CATALOGUE) or recommended by the advisers in the field-of-study major (see pamphlets prepared by the respective advisers), together with appropriate electives. Electives in Art, Philosophy, or Religion are recommended.

The Science curriculum requirements in English are the same as those of the Arts and Letters curriculum. A year course of social study is required. The foreign-language requirement is the same as for the Arts and Letters curriculum, except that French, German, or Russian is speci-

fied. At least 6 semester hours in Mathematics must be taken; additional work in Mathematics is required of prospective majors in Chemistry or Physics. In science, the student should take courses in both biological and physical sciences, bearing in mind the prerequisites stated by the department under which he expects to major, as well as specified prerequisites in certain departments (such as Mathematics and Chemistry for majors in Physics, or Mathematics and Physics for majors in Chemistry).

A transfer student admitted to Columbian College with deficiencies in freshman or sophomore work (whether in amount or in distribution of courses), corresponding to the programs outlined above, is required to begin to make up such deficiencies immediately upon admission to Columbian College, and to carry courses toward this end each semester until all the general education requirements described above are satisfied. Students transferring from the School of Government must complete pre-Columbian College requirements in science and in literature as prescribed in the Arts and Letters curriculum. Electives in Art, Philosophy, or Religion are recommended.

AMOUNT OF WORK

A full-time student who is not on probation may take ordinarily not more than 17 semester hours. A student employed more than 24 hours a week, who is not on probation, may take not more than 10 hours.

A full-time student whose quality-point index is 3.50 or higher may take not more than 19 hours. An employed student who meets the same standard may take not more than 12 hours.

A student previously unemployed who accepts employment subsequent to registration or at any time during a semester is required to report that fact immediately to the Dean, in order that adjustments in schedule may be made, if necessary, to bring his program within the Faculty's limitations upon the amount of work to be carried by an employed student.

ATTENDANCE

The student is held responsible for all the work of the courses in which he is registered, and all absences must be excused by the instructor in charge before provision is made for the student to make up the work missed. Excessive absence in any course will lead to loss of credit in that course, even though other requirements, such as tests, term papers, and examinations, are met.

CLASSIFICATION OF STUDENTS

A student who has completed less than 30 semester hours in Columbian College, and who has registered his major at the Office of the Registrar is classed as a *junior*. A student who has completed 30 hours in Colum-

bian College, including at least one course in his major, is classed as a *senior*. A student who has satisfactorily completed the work for the Bachelor's degree, and whose program of study has been approved and filed in the Office of the Registrar, is classed as a *master in course*.

INDEPENDENT STUDY PLAN

Under the independent study plan a student of demonstrated capacity, with special interest in the subject matter of a course, may be permitted to undertake independent study under the personal direction of an instructor, in accordance with the rules of the department or departments concerned. Credit under this plan is limited to the specific course-credits as designated in the list of courses of instruction in the CATALOGUE.

CORRESPONDENCE AND HOME-STUDY COURSES

No credit is given for work done by correspondence or in home-study courses.

THE BACHELOR'S DEGREES

Upon the satisfactory completion of the undergraduate requirements of Columbian College, the degree of Bachelor of Arts, Bachelor of Science, or Bachelor of Science in Medical Technology is conferred.

In cooperation with the School of Medicine a seven-year curriculum leading to the combined degrees of Bachelor of Arts and Doctor of Medicine is offered.

REQUIREMENTS FOR THE DEGREES

RESIDENCE

For the residence requirement, see pages 56-57. Students intending to transfer to Columbian College from a non degree-granting division of the University should note specifically the regulation concerning transfer within the University (see pages 54 and 55).

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 52 and 53.

In order to graduate, a student must have a general quality-point index of at least 2.00. In addition, the student with a Departmental Major must have a quality-point index of at least 2.50 in his major subject. Grades in courses taken at other institutions are not considered in computing the quality-point index. The student with a Field-of-Study Major meets the qualitative requirement by passing the Major Examination.

In computing the quality-point index in the major, all second-group and third-group courses in the major field taken at The George Washington University are included, even though minimum requirements for

the major may have been exceeded, except when registration for graduate credit is approved. Grades received in first-group courses are not considered.

Probation.—A student must maintain a quality-point index of at least 2.00, or be placed on probation. A student remains on probation as long as his quality-point index is below 2.00, or until his probation is removed by the Committee on Scholarship.

Suspension.—A student who has a quality-point index below 1.50 or who is placed on probation for a third semester, whether successive or after an interval, is suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. He must then submit evidence to the Committee on Admission and Advanced Standing that during his absence from the University he has so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

The foregoing scholarship rules are applied to a student with a limited schedule only when he has undertaken a minimum of 15 semester hours.

CURRICULUM REQUIREMENTS

The curriculum requirements for the Bachelor's degrees include at least 60 semester hours beyond the requirements of the Junior College (the curriculum in *Arts and Letters* or in *Science*) and the satisfactory completion of the major. Each program must be approved by the major adviser and by the Dean.

At least 24 hours of the last 60 hours counted toward the Bachelor's degree must be taken in subjects* not included in the major field or department. The student should consult his major adviser at each registration regarding the inclusion in his program of suitably distributed electives.

Except for students registered for the combined degrees of Bachelor of Arts and Doctor of Medicine, or for the degree of Bachelor of Science in Medical Technology, not more than 12 semester hours of professional courses may be included in the 124 hours required for the Bachelor's degrees in Columbian College. Columbian College students electing professional courses under this rule must obtain the approval, in advance, of the Dean's Council of Columbian College. Ordinarily courses in Physical Education, Secretarial Studies and technical courses in Education will not be approved for credit toward a degree in Columbian College.

* Art, Biology, Botany, Chemistry, Classical Languages and Literatures, Economics, English, Geography, Geology, Germanic Languages and Literatures, History, Journalism, Mathematics, Philosophy, Physics, Political Science, Psychology, Religion, Romance Languages and Literatures, Slavic Languages and Literatures, Sociology and Anthropology, Speech, Statistics, Zoology.

After selecting a curriculum, a student may not change to another except by permission of the Dean and on condition that he fulfill the requirements of the curriculum to which he changes which are in effect at the time the change is approved by the Dean.

Each student is required to select and file with the Registrar a choice of major upon entering Columbian College. He may change the major only with the consent of the Dean and of the department or committee concerned, and must meet the requirements for the new major which are in effect at the time the change is approved by the Dean.

First-group courses may be required as prerequisites to undergraduate major programs, but because of their introductory character may not be counted as part of such programs. (See "Explanation of Course Numbers.")

Students transferring from other institutions or from other schools, colleges, or divisions in this University with major requirements wholly or substantially met will, nevertheless, be required to complete satisfactorily at least 12 semester hours of approved work in the major field in Columbian College in order to receive a Bachelor's degree. This work will count as part of the minimum residence requirement.

Examination for Waiving Curriculum Requirements.—A student desiring to omit a required or prerequisite course may take such examination as the department prescribes, and, on passing satisfactorily, he may be relieved of the curriculum or prerequisite requirement in that subject and may qualify for registration in an advanced course. Passing of this examination shall not entitle him to any credit toward a degree. A student desiring to take such examination should make written request of the Dean and pay the required fee at the Office of the Treasurer before the date of the examination specified in the University calendar.

Use of Correct English.—Any student whose English in any course whatever is deemed unsatisfactory may be reported by the instructor to the Dean and to the Committee on the Use of Correct English. The Chairman of the Committee may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed by failure to make up any such deficiency in English to the satisfaction of the Committee and the Dean.

GRADUATE RECORD EXAMINATIONS

During the final semester of the senior year students in Columbian College are required to take the following Graduate Record Examinations: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and Area Tests (achievement), which measure breadth of knowledge and understanding in three broad areas of the

liberal arts: Natural Science, Social Science, and the Humanities. (For further information concerning the Graduate Record Examinations, see page 57.)

BACHELOR OF ARTS

The work of the junior and senior years, including a major in one of the following major fields, must be approved by the major adviser and by the Dean.

Major Fields.—American Thought and Civilization; Art (1) Art History and Theory, (2) Drawing and Painting, (3) Sculpture, and (4) Commercial Art; Biology; Botany; Chemistry; Economics; English Literature; French Language and Literature; Geography; Geology; Germanic Languages and Literatures; History; Journalism; Latin American Civilization; Mathematics; Philosophy; Physics; Political Science; Psychology; Religion; Sociology and Anthropology; Spanish American Literature; Spanish Language and Literature; Speech (Speech or Dramatic Art); Statistics; Zoology.

Combined Degrees of Bachelor of Arts and Doctor of Medicine.—A candidate for the combined degrees of Bachelor of Arts and Doctor of Medicine must: (1) complete the Medical School entrance requirements (see page 17); (2) fulfill the Junior College Arts and Letters requirements (see page 69); (3) fulfill the Columbian College residence requirement of at least 30 semester hours; (4) obtain the approval of the Dean of Columbian College at the time of entering the School of Medicine; (5) obtain the recommendation of the Dean of the School of Medicine at the completion of all prescribed courses in the first year of the School of Medicine, at which time the degree of Bachelor of Arts will be conferred (professional work taken at another institution will not satisfy the major requirement for the combined degrees); (6) maintain throughout the entire course the scholarship level required for graduation.

BACHELOR OF SCIENCE

The work of the junior and senior years, including a major in one of the following sciences, must be approved by the major department or division and by the Dean.

Biological Sciences: Biology, Botany, Zoology. *Physical Sciences:* Chemistry, Geology, Mathematics, Physics, Statistics.

THE UNDERGRADUATE MAJOR

There are two types of undergraduate majors: the field-of-study major and the departmental major.

THE FIELD-OF-STUDY MAJOR

Each Field-of-Study Major covers a carefully worked out field of coordinated study and is under the supervision of the appropriate department and the Columbian College Committee on Studies.

The *Field-of-Study Major* requires no specific number of semester hours, no specific program of courses, and no specific quality-point index for the major, although the student is required to meet the over-all general requirements for the degree (at least 124 semester hours with a quality-point index of at least 2.00). The Major Examination in the Field-of-Study Major replaces all of the traditional quantitative and qualitative requirements for a major. Ability to pass the Major Examination is assumed to be a convincing demonstration that the student possesses the breadth, depth, and quality of knowledge of his major usually defined in terms of semester hours, courses, grades, and a better-than-average quality-point index. A pamphlet prepared under the direction of the adviser in the field of study and obtainable either from the adviser or from the Office of the Dean of Columbian College provides the information needed by the prospective student, who should place himself under the direction of the appropriate adviser immediately upon completing Junior College work and beginning his junior year (the first senior-college year) in Columbian College.

The Field-of-Study Major places special emphasis on the intellectual development of the individual student. Programs in the same major may vary, depending upon the individual student's background, previous study, reading habits, and aptitudes. The student is expected to consult his adviser frequently, and the special proseminar offered in the field gives him further opportunity for individual advice and direction in pursuing a program especially adapted to his needs and abilities. A close student-adviser relationship is essential for the student's success under the Field-of-Study Major plan.

The following Field-of-Study Majors are offered: American Thought and Civilization, Biology, English Literature, French Language and Literature, History, Latin American Civilization, Philosophy, Spanish American Literature, Spanish Language and Literature, Statistics, Zoology.

The major in Biology extends broadly over the field of Biological Sciences and those in American Thought and Civilization and in Latin American Civilization involve studies in two areas, those of Languages and Literatures and of Social Sciences. The other Field-of-Study Majors, with the exception of the major in Spanish American Literature, replace departmental majors in their respective fields. A candidate for a Bachelor's degree with a major in Biology, English Literature, French Language and Literature, History, Philosophy, Spanish American Literature, Spanish Language and Literature, Statistics, or Zoology must elect a Field-of-Study Major.

Proseminar in the Major

For the convenience of the student a proseminar is offered in each field of study. This course, planned and administered by the professor or adviser responsible for the field, will advise, guide, and instruct the student

in his reading, study, and laboratory exercises in order to assist him in gaining a coordinated knowledge of his field. It is a presentation of the content and methods of the major field as a whole through the organization and coordination of the knowledge obtained in the various formal courses in the major subject and of material not usually included in such courses. This course is not required. Six semester hours, but no qualitative grade, may be assigned. When registered in this course, the student will have the privilege of visiting, subject to the approval of the instructor, any other appropriate course offered in the College. (Regular attendance in a course, either for credit or as an auditor, requires registration and payment of tuition.) Proseminars are open only to the student who has been accepted as a candidate under that specific major.

The Major Examination

The Major Examination will normally be taken by the student at the close of the senior year; in the case of a student on a limited schedule, the Major Examination may be taken not earlier than one calendar year before graduation. A student who fails to pass a Major Examination may, at the discretion of the Columbian College Committee on Studies, be reexamined at a later regular major-examination period. The Committee on Studies will have general supervision of the preparation, reading, and grading of Major Examinations. Major Examinations will be held each semester on dates fixed by the department or departments concerned, but in no case later than January 15 for the fall semester, May 15 for the spring semester, and August 7 for the summer session.

DEPARTMENTAL MAJORS

Departmental Majors, unlike *Field-of-Study Majors*, are specifically defined in terms of credit hours, required courses, and the attainment of a quality-point index of at least 2.50 in all second-group courses taken in the major field. The minimum specific requirements for *Departmental Majors* are listed below the staff of instruction of the department concerned in the section of the CATALOGUE devoted to courses of instruction. The Executive Officer of the Department, or designated departmental adviser, should be consulted at registration concerning the student's program of courses; and the entire program, including electives, must be approved by the Department. The student is also expected to consult the Executive Officer or adviser in all matters affecting his program of studies, such as changes, substitutions, or withdrawals, and especially concerning his progress in his courses. As far as possible the close student-adviser relationship developed in the *Field-of-Study Major* will be cultivated also in *Departmental Majors*.

Until further notice *Departmental Majors* will be offered in the following: Art (1) Art History and Theory, (2) Drawing and Painting, (3)

Sculpture, and (4) Commercial Art; Botany; Chemistry; Economics; Geography; Geology; Germanic Languages and Literatures; Journalism; Mathematics; Physics; Political Science; Psychology; Religion; Slavic Languages and Literatures; Sociology and Anthropology; Speech (Speech or Dramatic Art).

BACHELOR OF SCIENCE IN MEDICAL TECHNOLOGY

In cooperation with the University Hospital and the Department of Pathology of the School of Medicine, Columbian College offers work leading to the degree of Bachelor of Science in Medical Technology.

A candidate for the degree of Bachelor of Science in Medical Technology must fulfill the Junior College Medical Technology Curriculum (see page 71); fulfill the Columbian College requirements for degrees, including the residence requirement of at least 30 semester hours; complete the twelve-month Medical Technology Course in the University Hospital; and maintain throughout the entire course the scholarship level required for graduation.

Admission to the Columbian College degree program does not assure acceptance in the Hospital program. For further information, see pages 112 and 113.

THE MASTER'S DEGREES

Upon the satisfactory completion of the graduate requirements of Columbian College, the degree of Master of Arts, Master of Science, or Master of Fine Arts is conferred.

DEFINITION OF THE MASTER'S WORK

The study leading to the Master's degree is a comprehensive survey of a field of knowledge. It is a continuation of the work of the student's undergraduate major and involves a great acquaintance with scholarly method.

The student must satisfy certain minimum requirements as to previous preparation, residence, ability to read an approved modern foreign (European) language, and courses taken; but these requirements, while essential, are regarded primarily as qualifying measures. The student's knowledge of his field, as demonstrated by his thesis and by the results of his Master's Examination (together with such other examination involving special skills or techniques as the department or the Columbian College Committee on Studies may require), is the basis upon which the Master's degree is conferred.

MASTER OF ARTS

Graduate work leading to the degree of Master of Arts is offered in the following fields:

American Literary and Cultural History, Art History and Criticism, Bacteriology, Biochemistry, Biology, Botany, Chemistry, Chemotherapy, Economics, English and American Literature, English Literature, French Language and Literature, Geography, Geology, Germanic Languages and Literatures, History, Latin American Civilization, Mathematics, Museology, Pharmacology, Philosophy, Physics, Physiology, Political Science, Psychology, Religion, Religious Education, Sociology and Anthropology, Spanish American Literature, Spanish Language and Literature, Speech Correction, Statistics, Zoology.

Special programs involving coordinated work in two or more departments may be arranged with the approval of the departments concerned and the Columbian College Committee on Studies.

MASTER OF SCIENCE

Graduate work leading to the degree of Master of Science is offered in the following fields:

Anatomy, Bacteriology, Biochemistry, Biology, Botany, Chemistry, Chemotherapy, Geology, Mathematics, Pharmacology, Physics, Physiology, Psychology, Statistics, Zoology.

Special programs involving coordinated work in two or more departments may be arranged with the approval of the departments concerned and the Columbian College Committee on Studies.

MASTER OF FINE ARTS

Graduate work is offered leading to the degree of Master of Fine Arts in the fields of painting and of sculpture. (See the Department of Art.)

REQUIREMENTS FOR THE DEGREES

RESIDENCE

Normally, an academic year of residence in Columbian College is required, i.e., completion of a minimum of 30 semester hours of work including the thesis, which is counted as the equivalent of 6 semester hours of course work. Summer work may be counted in residence, but in no case may the period of residence aggregate less than twenty-seven weeks. Not more than 12 semester hours (which must be approved in advance by the Dean of Columbian College) may be taken in another school or division of this University, and such work may not be counted toward both a degree in that school or division and the Master's degree in Columbian College. *No part of the minimum requirement may be taken elsewhere.* All work for the degree of Master of Arts, Master of Science, or Master of Fine Arts must be completed within a maximum of three years, unless the Dean's Council considers the circumstances so unusual as to justify an extension of time.

SCHOLARSHIP

A Master's candidate must attain the grade of *E* (excellent) in at least 6 semester hours of the course requirements for the degree in order to receive the Master's degree.

A student whose scholarship is unsatisfactory may be suspended by the Dean upon recommendation of the department under which the student is working. A Master's candidate who accumulates 9 hours or more of *U* (unsatisfactory) (including grades of *C* or lower in prerequisite courses) will be automatically suspended. Regarding the system of grading, see pages 52 and 53.

PROGRAM OF STUDIES

The student's program of studies must be outlined in detail at the beginning of his work, in triplicate, on forms available at the Office of the Dean. Each program is subject to the approval of the department and the appropriate member of the Columbian College Committee on Studies. The program may be revised as the occasion requires, but any change necessitates a repetition of the procedures just described.

The candidate for the Master's degree ordinarily may specialize exclusively in the field of his choice. Any student, however, whose undergraduate training does not include at least one full year of work in each of the following areas of study: (1) mathematics or science (with or without laboratory), (2) social science, and (3) the humanities (literature, philosophy, art, music, or religion), must make up this deficiency in his general education before being admitted to candidacy for the Master of Arts degree. This last provision does not apply to candidates for the Master of Science degree.

Courses numbered from 1 to 100 may not be credited toward the Master's degrees, but may in certain instances be required as a basis for advanced work. At least 6 semester hours of the course work required for the Master's degree must be taken in courses numbered over 200. Courses numbered over 100 may be credited toward the degree, provided the completion of additional work has been certified by the appropriate officer of instruction. (See "Explanation of Course Numbers".)

A student who expects to continue his studies for the degree of Doctor of Philosophy after receiving the Master's degree is strongly advised to plan his program from the beginning so that work for the lower degree will constitute the initial stage of the doctoral discipline and, upon completion, will admit him to full status in the Graduate Council (see page 93).

FOREIGN LANGUAGE REQUIREMENT

Before being admitted to candidacy the student must show that he has a reading knowledge (certified by the appropriate foreign-language de-

partment) of at least one modern foreign (European) language, selected by the department or committee under which he is studying. A student whose field is a modern foreign language or literature may not offer that language in satisfaction of the reading-knowledge requirement. Any Master's candidate who chooses to meet the Master's language requirement in French, German, or Spanish and has not passed the French, German, or Spanish foreign language examination by the end of 15 attempted semester hours must register for French 49, German 49, or Spanish 49 as part of his next registration. The Master's reading examinations will be given at the first class meeting of French 49, German 49, and Spanish 49, again at the end of the courses, and on the last Saturday of the Summer Term; no student, however, will be permitted to take the examination after three unsuccessful attempts. Those enrolled in French 49, German 49, or Spanish 49 who pass the first examination are excused from the course and will receive a refund of tuition. Students who expect to take a reading examination in any approved language other than French, Spanish, or German should notify the Dean at the time of registration.

Students are reminded of the necessity for early satisfaction of this requirement, normally not later than the end of the first semester of registration for the degree.

ADMISSION TO CANDIDACY

A student must be admitted to candidacy before he begins the last half of his work for the Master's degree, i.e., not later than the completion of 15 semester hours of degree courses. Application for admission to candidacy is made on a form obtained at the Office of the Dean, and must be approved by the appropriate representative of the department or committee and by the Dean. If a prospective candidate, in his previous academic work, has not substantially satisfied the prerequisites for the Master's degree, including the undergraduate major as defined by the appropriate department or committee, he will not be admitted to candidacy until such deficiency has been made up. He may make up his deficiencies by electing appropriate courses in addition to those counted toward his degree.

THE THESIS

The thesis may be of a research, expository, critical, or creative type. The main purpose of a Master's thesis is to demonstrate the student's ability to make independent use of the information and training acquired through his other disciplines, and to furnish objective evidence of his constructive powers in his chosen field. Registration for the thesis must be no later than the beginning of the final year of preparation, unless the professor in charge of the thesis permits registration at the beginning of the final semester. The choice of the thesis subject must be approved by the professor in charge of the student's field and recorded in the Office

of the Registrar by the date announced in the University calendar. Registration for the thesis is ordinarily made on the basis of 3 hours for each of two successive semesters. In exceptional cases, and with the approval of the professor in charge of the thesis, the student may register for the entire 6 hours during a single semester. The thesis in its final form must be presented to the Dean, no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see page 57) are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period the student must register for it again, and pay tuition on the same basis as for a repeated course.

THE MASTER'S EXAMINATION

In addition to such other examinations as may be required, the candidate must pass a general written examination on the major subject. Examinations will be held on dates fixed by the department or committee, but in no case later than January 15 for the fall semester, May 15 for the spring semester, and August 7 for the summer session. The provisions of the field-of-study plan for undergraduate majors which concern the general examination for the major also apply to the Master's Examination. A candidate who fails to pass the Master's Examination may, in exceptional circumstances and with the specific approval of the Columbia College Committee on Studies, repeat the examination, but only after the lapse of one semester. If he fails a second time, no further opportunity to take the examination will be permitted.

THE GRADUATE COUNCIL

A. E. Burns, *Dean and Chairman*

MEMBERS OF THE COUNCIL*

Professors P. W. Bowman, J. W. Brewer, H. F. Bright, A. E. Burns, R. D. Campbell, J. H. Coberly, R. H. Davison†, Mitchell Dreese, D. C. Faith, Wood Gray, A. M. Griffin, I. B. Hansen, C. A. M. Hogben, Thelma Hunt, Herbert Jehle, F. E. Johnston, E. L. Kayser, R. D. Kennedy, W. H. Kraus, C. E. Leese, W. K. Legner, H. L. Ley, Jr., C. D. Linton, H. G. Mandel, G. E. McSpadden, F. M. Mears, H. M. Merriam, C. R. Naeser, N. D. Nelson, M. I. Protzman, M. L. Robbins, W. F. Sager, Lewis Slack, P. K. Smith, R. B. Stevens, I. R. Telford‡, C. R. Treadwell, F. S. Tupper, B. D. Van Evera, D. S. Watson, W. R. West, R. E. Wood, S. N. Wrenn; *Associate Professors* F. D. Allan, J. G. Allee, Jr., W. E. Caldwell, W. G. Clubb, W. C. Davis‡, Clarke Davison, R. C. Haskett, P. H. Highfill, Jr.||, J. W. Kendrick, H. L. LeBlanc, T. P. G. Liverman, J. N. Mosél, S. C. Munson, C. E. Olmstead, T. P. Perros, J. P. Reesing, Jr., E. M. Renkin, J. W. Robb, William Schmidt, Wilson Schmidt‡, R. B. Thompson, C. E. Tuthill§, R. D. Walk; *Assistant Professors* Rudolph Hugh, J. C. King, J. W. Skinner

Consultants in Research S. J. Ajl, Antonio Alonso, R. A. Altenbern, R. W. Bolwell, G. M. Briggs, B. B. Brodie, Arthur Brown, Dean Burk, J. Burns, W. R. Carroll, H. M. Cathey, C. L. Christ, R. W. Clarke, Gerhard Colm, M. G. deVries, W. R. Duryee, F. N. Frenkiel, N. B. Gove, R. L. Grant, Edward Hackaylo, H. F. Haviland, Jr., Roger Hilsman, Leon Jacobs, L. C. Johnson, Solomon Kullback, B. N. La Du, Jr., H. M. Lenhoff, L. L. Marton, Margaret Mercer, Winfred Overholser, L. W. Parr, R. A. Patnode, J. J. Polak, J. H. Roe, S. M. Rosenthal, L. P. Schultz, D. B. Shimkin, R. S. Sigafos, L. B. Smith, DeWitt Stetten, Jr., M. J. Surgalla, Sidney Udenfriend, E. P. Vollmer, Ludwig von Sallmann, F. M. Weida, Henry Welch, G. G. Wright, W. H. Wright, R. A. Young

GENERAL INFORMATION

INTRODUCTORY

The Graduate Council offers a program of advanced study and research leading only to the degree of Doctor of Philosophy. It was estab-

* The President of the University, the Dean of Faculties, and the Registrar of the University are members of the Council.

This listing of Members of the Council and Consultants in Research is for the academic year 1959-60.

† On leave of absence spring semester 1959-60.

‡ On sabbatical leave spring semester 1959-60.

§ On sabbatical leave 1959-60.

|| On leave of absence 1959-60.

lished in 1930 to replace the Graduate School which had formerly administered work for the Master's as well as the Doctor's degrees. The Graduate Council provides a doctoral discipline which moves freely across administrative lines dividing departments of instruction or fields of study. It gives personal supervision to a limited number of students, each of whom has his own consultative committee, examinations, and research direction.

ADMISSION PROCEDURE

For admission to doctoral work the student must possess adequate preparation for advanced study, together with acceptable personal qualities and a capacity for creative scholarship. Adequate preparation presupposes a satisfactory Bachelor's degree in the same general field as that proposed for doctoral study. Students beginning the first year of graduate study who plan to work towards the degree of Doctor of Philosophy are given provisional status in the Graduate Council. However, if these students wish, and if the Dean of the Graduate Council so advises, they may register for the Master's degree in the liberal arts (Columbian) college or in the School of Government during the first year and apply for transfer to full status in the Council upon completion of the Master's degree work.

Application forms may be obtained from the Office of the Dean of the Graduate Council. At the time of filing the application, either in person or by mail, the student should request that transcripts of all previous academic training be sent to the Office of the Dean, together with letters of recommendation. Each application, with transcripts and letters, is examined by a committee which, if the applicant is accepted, constitutes his Consultative Committee. This Committee supervises all aspects of the student's program and work, leading to the general examinations (Council Fellowship Examination).

THE PLAN OF WORK

The discipline for the degree is divided into three stages. (1) The first year of graduate study constitutes the initial stage, either in the Graduate Council on provisional status, or in Columbian College or the School of Government enrolled as a Master's candidate intending to gain full status in the Council.* (2) Full status in the Council follows completion of the first year of graduate study and culminates in the Council Fellowship Examination. (3) The final stage is given to research and investigation of a particular project in a special field, the presentation of the findings in a written dissertation, and the Final Examination.

LANGUAGE EXAMINATIONS

French and German are the normally required languages; reading proficiency must be demonstrated by examination. The examinations are

* Students on a part-time basis will normally complete a year of graduate study in two years.

arranged through the Office of the Dean. The satisfactory completion of French 49 and/or German 49 meets the language requirement. The Consultative Committee may allow either French or German to be replaced by another language important to the student's research interest. Language examinations may be taken soon after entrance, but the first one must be passed no later than the beginning of the second semester following admission. The second examination must be passed well before completion of work for the Council Fellowship Examination.

THE FIRST YEAR OF STUDY

A student who enters the Graduate Council on provisional status to undertake the first year of graduate study has his program planned by a Consultative Committee. If the first year of work is taken in Columbian College or the School of Government preparatory to gaining full status, Graduate Council advisers aid in planning the Master's program to fit the work into the doctoral program of the student. Upon satisfactory completion of the first year the student is eligible to apply for full status. Students who have completed a year of satisfactory graduate work at other universities are eligible to apply directly for full status in the Graduate Council.

STUDY FOR THE COUNCIL FELLOWSHIP EXAMINATION

At the beginning of the student's full status, the Consultative Committee is assigned to direct his work in an integrated group of fields of learning, usually five or six in number, deemed necessary to insure his breadth of knowledge, as well as to support the dissertation project in his central field. Members of the Consultative Committee advise the student concerning the scope and content of these supporting fields, and will assist him in preparation for his examination in them.

This advanced study in full status does not entail the taking of a second full year of graduate courses and seminars. Additional course work may not be necessary in some cases; in any event, the Consultative Committee determines whether such additional course work is needed, and if so, how much. In this stage of the work the main emphasis in preparation is on conferences with committee members and independent study. Performance in the Council Fellowship Examination is the test of the student's ability to enter upon the final stage of his doctoral discipline.

The examination is a series of written tests usually extending over a period of one week. The major portion of a day is given to each part of the examination covering one of the fields of study on the student's program. If the results of the examination are satisfactory the student is admitted as a Fellow of the Graduate Council, to pursue his specialized study and research under the supervision of a member of the Council.

RESEARCH, THE DISSERTATION, AND THE FINAL EXAMINATION

After the student has been inducted as a Fellow of the Council and his research program has been arranged, he is responsible to the member of the Council who directs his research project. As a Fellow, he may attend general meetings of the Council and participate in the programs of research discussion, and enjoy unrestricted use of all the academic facilities of the University. When necessary, the Graduate Council makes provision for sending the Fellow to some other institution, library, or laboratory for special study in connection with his doctoral investigation.

The doctoral dissertation is required of all Fellows as evidence of ability to perform scholarly research and to interpret its results. No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary. Printed copies of detailed regulations regarding the form and reproduction of the dissertation and its summary (see page 57), are available in the Office of the Dean. The summaries of accepted dissertations will be printed in a numbered issue of the University BULLETIN. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

When the completed dissertation has been approved by the Master, and by two other members of the Council, and submitted to the Office of the Dean, the Fellow is presented for his final examination. This examination is oral and open to the public. The committee of examiners includes not only members of the Council competent in the research field or in closely related subjects, but also at least two qualified experts from other research institutions brought to the University to participate in the examination. If the Fellow satisfies the examining committee concerning the high quality and originality of his contribution to knowledge as well as his mastery of the scholarship and research techniques of his field, the Council recommends him for the degree of Doctor of Philosophy.

FIELDS OF RESEARCH

The following fields of research have been authorized by the Graduate Council as those in which doctoral investigations and dissertations may be undertaken. The supporting fields of study required of all candidates for the degree of Doctor of Philosophy are specified for each individual student by his Consultative Committee before admission to study under the Council.

This list of fields is subject to such changes as the educational resources of the University may direct. The prospective student may address preliminary inquiries concerning his research interests to the member of the Council who is in charge of the field, or to the Dean of the Graduate Council.

LITERATURES AND LANGUAGES

American

- (1) Fiction; (2) Social Themes in Literature;
(3) Literary Nationalism

Coberly

English

- (1) Sixteenth Century Drama; (2) Seventeenth Century Drama
Seventeenth Century Literature
(1) Eighteenth Century Literature; (2) History of English Drama
Twentieth Century Literature

Tupper
Reesing
Highfill
Linton

Germanic

- (1) Middle High German Language and Literature; (2) Early
New High German Language and Literature
(1) Old High German Language and Literature; (2) German
Romanticism
Old Norse Language and Literature

Legner

King

Allee

Romance

- Modern Spanish Literature
(1) Linguistics; (2) Spanish American Literature;
(3) Spanish Literature
Seventeenth Century Literature
French Literature since 1880
(1) Spanish American Literature; (2) Modern Spanish Literature

Alonso
McSpadden

Protzman
Clubb
Robb

SOCIAL SCIENCES

Economics

- History of Economic Thought
Economic Policy
Economic Theory
International Economics
International Finance
Methodology of Economics
National Income
Public Finance
Soviet Economics
Transportation

Burns
Watson
Watson, Skinner
Schmidt
Polak, Young, de Vries
Skinner
Kendrick, Colm
Colm
Shimkin
Kennedy

Geography

- Area Synthesis

Campbell

History

- European: Diplomatic since 1815
European: Nationalism
European: Russian and Soviet
History of Religion in the United States
The Modern Near East
Latin American
United States: Diplomatic
United States: (1) Social; (2) Economic
United States: Political

Davison
Kaysr
Thompson
Olmstead
Davison
Davis
Merriman
Gray
Haskett

International Relations

Program includes work in Economics, History, and Political Science

Political Science

Comparative Government and Political Theory	Kraus
International Politics and Organization	
International Law: (1) War and Neutrality; (2) Arbitration	Brewer
International Relations	Hilsman
International Relations, especially American Foreign Policy	Haviland
(1) The Political Process; (2) Political Controls over Administrative Agencies	LeBlanc
United States: (1) The Legislative Process; (2) Governmental Organization and Administration	West

Psychology

Abnormal	Mercer
Comparative	Caldwell
Counseling and Guidance	Dreese
Experimental	Walk
Military Counseling and Guidance	Faith
Personnel Psychology	Mosél
(1) Psychological Measurements; (2) Abnormal Psychology	Hunt
Social Psychology	Tuthill

MATHEMATICAL AND PHYSICAL SCIENCES

Chemistry

Analytical	Schmidt
Geochemistry	Naeser, Christ
Inorganic	Naeser, Perros
Organic	Wrenn
Physical: Kinetics and Electrochemistry	Wood
Physical: Solubilities	Van Evera
Physical-Organic: Reaction Mechanisms	Sager

Mathematics

Algebra: Finite Groups	Johnston
Analysis: Functional Analysis	Liverman
Analysis: Infinite Series	Mears
Mathematical Logic	Nelson

Physics

Biophysics; Theoretical: (1) Quantum Mechanics; (2) Molecular Physics; (3) Relativity	Jehle
Electron Optics	Marton
(1) Experimental Nuclear Physics; (2) Radioactivity	Slack
Low Energy Nuclear Physics	Gove
Theoretical: Aerodynamics	Frenkiel

Statistics

Multivariate Analysis	Kullback
(1) Applied: Econometrics; (2) Theoretical: Probability and Sampling	Weida
(1) Psychometrics; (2) Managerial Statistics	Bright

MEDICAL SCIENCES

Anatomy

Embryology
Gross Anatomy
Histology
Neuro-ophthalmology

Allan
Telford
Telford, Johnson
von Sallmann

Bacteriology

Antibiotics
Bacterial Physiology and Nutrition
Coliform Bacteria and Antibiosis
Determinative Bacteriology
Immunity in Tuberculosis
Immunology
(1) Intestinal Microbiology; (2) Immunology: Antigenic Analysis
Microbiology
Virology

Welch
Ajl, Altenbern
Parr
Hugh
Patnode
Surgalla, Wright
Griffin
Jacobs
Robbins, Ley, Brown

Biochemistry

Amino Acid Metabolism
Animal Nutrition
Ascorbic Acid Metabolism
Biochemical Detoxication
(1) Carbohydrate Metabolism; (2) Nutrition (emphasis on
vitamins); (3) Pathological Chemistry
Carbohydrate Metabolism
Chemistry and Metabolism of Proteins
Lipids
Metabolic Relationships of Insulin
Protein Biosynthesis
Tissue Respiration

La Du, Udenfriend
Briggs
Burns
Brodie
Roe
Stetten
Carroll
Treadwell
Grant
Lenhoff
Burk

Pharmacology

Chemotherapy
Medicinal Chemistry
Drug Metabolism

Smith
Mandel
Davison, Mandel, Smith

Physiology

(1) Blood Pressure Studies; (2) Neuro-muscular Studies
Cardiovascular Shock
Cellular Physiology
Endocrinology
(1) Gastrointestinal Physiology; (2) Electrolyte Metabolism
Hemo-dynamics
Peripheral Circulation

Leese
Rosenthal
Duryee
Vollmer
Hogben
Clarke
Renkin

Psychiatry

Problems of Treatment (M.D. degree required for admission)

Overholser

BIOLOGICAL SCIENCES

Biology

Cytology

Bowman

Botany

(1) Mycology; (2) Plant Pathology	Stevens
Taxonomy	Smith
Plant Physiology: Vascular Plants	Cathey
(1) Mycology; (2) Plant Physiology: Micro-organisms	Hacskeylo
Plant Ecology	Sigafoos

Zoology

Entomology: Insect Physiology	Munson
Parasitology: Parasitic Protozoa	Wright
Vertebrate: Embryology and Morphogenesis	Hansen
Vertebrate: Ichthyology	Schultz

POST-DOCTORAL STUDY

The Council expects its graduates to continue their interest in advanced study and research, and to contribute to its program. All graduates are listed as Associate Fellows and, upon request, will receive notices of all general meetings. They may continue any studies in the University without payment of tuition, and enjoy all University library privileges. Such graduates are required to pay only the usual residence fee in order to establish their active membership in the University. The use of laboratory space and equipment is contingent upon availability, and the cost of all laboratory or special library material is paid by the graduate. Special arrangements for such privileges must be made with the Dean of the Council. Post-doctoral work taken under this privilege may not be applied toward any degree offered by the University.

REGULATIONS

Candidates and Fellows in the Graduate Council are subject to, and are expected to familiarize themselves with, the regulations regarding REGISTRATION, FEES AND FINANCES stated on pages 13-30, and the University regulations stated on pages 52-59.

RESIDENCE AND CONTINUOUS REGISTRATION

The Graduate Council expects all students to work on their doctoral programs in residence, although there is no formal regulation concerning the minimum amount of time of resident study either in preparation for the Council Fellowship Examination or as a Fellow of the Council engaged in doctoral research. The student who undertakes either part of the doctoral program on full or limited schedule must, in accordance with University regulations, maintain continuous registration under the Graduate Council even when the Council has granted a leave of absence for study or residence elsewhere. Failure to maintain registration in each semester of the academic year disrupts the residence status of the student (see pages 56-57). In such case, the student must reapply for admission to

the Council, under whatever new conditions and regulations are set up by his consultative committee or the member of the Council who directs his research.

TEACHING FELLOWSHIPS AND GRADUATE ASSISTANTSHIPS

A limited number of teaching fellowships are assigned annually to certain departments of instruction open to doctoral students registered under the Graduate Council. In many departments of instruction graduate assistants are appointed to assist in the academic program. Applicants for teaching fellowships and graduate assistantships should inquire directly of the executive officer of the department concerned regarding vacancies, details of appointment, and the kind of personal data to be supplied for consideration.

UNITED STATES GOVERNMENT FELLOWSHIPS

The George Washington University is participating in the following Government Fellowships Programs: National Science Foundation Co-operative Graduate Fellowships and Summer Fellowships for Graduate Teaching Assistants, and the Fellowships created under the National Defense Education Act. Qualified students should write directly to the Dean of the Graduate Council for information and applications for these Fellowships.

A pamphlet describing details of the Graduate Council program, together with a current list of fields of research offered by the Council, will be sent upon request to the Office of the Graduate Council.

THE SCHOOL OF MEDICINE*

THE FACULTY†

John Parks, *Dean*; A. M. Griffin, *Associate Dean*; A. E. Parrish, *Associate Dean*

Professors H. F. Anderson, R. H. Barter, Brian Blades, T. M. Brown, Paul Calabrisi, C. S. Coakley, R. A. Cox, A. M. Griffin, C. A. M. Hogben, C. E. Leese, H. L. Ley, Jr., H. G. Mandel, John Parks, T. M. Peery, P. K. Smith, W. W. Stanbro, Harold Stevens, I. R. Telford‡, C. R. Treadwell, J. W. Watts, C. S. Wise, Leon Yochelson; *Clinical Professors* W. S. Anderson, H. L. Darner, C. R. L. Halley, W. S. McCune, E. A. W. Sheppard; *Associate Professors* F. N. Miller, Jr., A. E. Parrish; *Associate Clinical Professors* L. R. Culbertson, W. A. Howard, J. J. McFarland, Jr.; *Assistant Clinical Professor* J. L. Levine; *Administrator of the University Hospital* V. F. Ludewig

COMMITTEES§

THE DEAN'S COUNCIL

Brian Blades, A. M. Griffin, A. E. Parrish, T. M. Peery, P. K. Smith, J. W. Watts, V. F. Ludewig

COMMITTEE ON ADMISSIONS

Paul Calabrisi (*Chairman*), H. G. Mandel, W. P. McKelway, F. N. Miller, Jr., J. E. Rankin

COMMITTEE ON CURRICULUM

T. M. Peery (*Chairman*), C. A. M. Hogben, M. J. Romansky, J. G. Sites, I. R. Telford, J. R. Thistlethwaite, C. R. Treadwell

COMMITTEE ON SCHOLARSHIP

I. R. Telford (*Chairman*), Brian Blades, T. M. Brown, C. A. M. Hogben, T. M. Peery

COMMITTEE ON RESEARCH

A. M. Griffin (*Chairman*), J. M. Evans, H. L. Ley, Jr., H. C. Pierpont, P. K. Smith, Harold Stevens, C. R. Treadwell

* Faculty and committee members listed here are for the academic year 1959-60.

† The President of the University, the Dean of Faculties of the University, and the Registrar of the University are members of the Faculty.

‡ On sabbatical leave spring semester 1959-60.

§ The Dean of the School of Medicine is a member ex officio of all committees.

COMMITTEE ON LIBRARY

C. E. Leese (*Chairman*), Seymour Alpert, S. W. Bush, H. G. Mandel, M. L. Robbins

COMMITTEE ON GRADUATE AND POSTGRADUATE EDUCATION

T. M. Brown (*Chairman*), R. H. Barter, Brian Blades, C. S. Coakley, A. E. Parrish, Leon Yochelson, V. F. Ludewig

COMMITTEE ON APPOINTMENTS AND PROMOTIONS

Brian Blades (*Chairman*), A. M. Griffin, A. E. Parrish, T. M. Peery, P. K. Smith

ADVISORY COMMITTEE ON CANCER RESEARCH

P. K. Smith (*Chairman*), L. K. Alpert, J. M. Bailey, J. K. Cromer, C. P. Donlan, C. T. Klopp, William Newman, M. L. Robbins

ADVISORY COMMITTEE ON REHABILITATION

C. S. Wise (*Chairman*), J. P. Adams, T. M. Brown, J. M. Evans, I. G. Tamagna, J. R. Thistlethwaite

GENERAL INFORMATION

INTRODUCTION

The School of Medicine of The George Washington University was opened in March 1825. Of the medical schools now in existence in the United States, it is the eleventh in chronological order of founding. The University Hospital and Dispensary were established in 1898 as a part of the organization of the School. The new George Washington University Hospital was opened in 1948, and the Cancer Clinic building was completed in 1954. Additional clinical facilities are used at the District of Columbia General Hospital, Children's Hospital, St. Elizabeths Hospital, and Mt. Alto Veterans Administration Hospital. The School of Medicine maintains close affiliation not only with the various divisions of the University, but also with the numerous medical research and scientific establishments of the federal government in the Nation's Capital. Washington provides world renowned library facilities, comprehensive museums, and excellent recreational facilities which are available to students.

OBJECTIVES

The purpose of the School of Medicine is to prepare men and women in the art and science of medicine to meet the health needs of a growing, ever changing society. It is the responsibility of the School of Medicine

to provide its students with a systematic plan of instruction in the basic medical sciences, with well guided clinical experience, with opportunities for expression in research, and with a philosophy in keeping with the highest ethics of the profession.

For undergraduates the aims of the School of Medicine are (1) to select students of superior ability and character; (2) to teach the theoretical principles, laboratory techniques, and clinical applications of the medical sciences; and (3) to provide a diversity of clinical experience through well supervised clerkships in University, public, and federal hospitals providing facilities for all specialized fields of medicine.

The aims of the School of Medicine in graduate and post graduate education are (1) to provide well planned services for internship and resident training in both general and specialized practices; (2) to direct an expanding program of applied research, integrated with teaching at the School of Medicine, and in keeping with the growth of Washington as one of the world's great centers of medical investigation; and (3) to provide postgraduate instruction in recent advances in medicine.

To achieve these objectives the School of Medicine has developed a progressive plan of instruction and a balanced, comprehensive curriculum. To carry out the program the University seeks to maintain a faculty of adequate size and outstanding ability, making use of facilities which provide exceptional opportunities for research and clinical training.

PLAN OF INSTRUCTION

The curriculum is a progressive one, beginning with basic medical science and expanding to include the more complex aspects of the prevention of disease and care of the sick. The teaching program is organized under the various departments of the School of Medicine. (See "Courses of Instruction".)

The schedule for the first year begins with an orientation week designed to introduce the new students to the Faculty, to the upperclassmen, and to the environment for their medical education. The students meet for informal panel discussions with upperclassmen and members of the Faculty on such subjects as curriculum, medical terminology, use of library facilities, ethics and aims of the medical profession, and student health.

First year instruction is given in anatomy, biochemistry, and physiology using the classroom and laboratory facilities of the School of Medicine. Early in their medical careers students are encouraged to participate in research. Practical problems in patient care are introduced at conferences in the University Hospital.

Having completed the preliminary study of structure and function of

the normal body, the student progresses in the second year to a consideration of disease processes and mechanisms. The various microbial agents capable of causing disease are studied in the course in microbiology, and the effect of these and other harmful substances upon the body are studied in the course in pathology. The modes of action of various therapeutic agents are considered in the course in pharmacology. Introductory lectures and demonstrations in the clinical sciences are given during the second semester in order to prepare the student for the responsibilities of the following year.

In the third year the student is assigned to the District of Columbia General Hospital for lectures, conferences, and clinical studies. He serves in the various divisions of the hospital assisting in the preparation of clinical records and performing certain clinical laboratory examinations. He learns to carry out the usual ward procedures and to use certain diagnostic and therapeutic instruments. During this period instruction is individual or in small groups. The instructor reviews the student's observations at the bedside and guides him in the development and application of his knowledge.

During the summer period following the third year each student is required to spend eight weeks in one of the clinical facilities of the School of Medicine.

In the fourth year the student's responsibility for inpatient care continues and enlarges, but at least an equal part of his time is spent in the study and care of clinic patients. The University Hospital, the District of Columbia General Hospital, Children's Hospital, Mount Alto Veterans Administration Hospital, and St. Elizabeths Hospital provide the student with experience in many fields. In this final year of formal medical education stress is placed upon the total patient and his environment so that emotional and economic as well as physical factors may be considered in the restoration of the individual to a state of health and happiness.

Upon satisfactory completion of the four-year course of the School of Medicine, the student is well prepared for graduate training leading to a career in general or specialty practice, research, medical education, or government service.

THE CURRICULUM

Subject	Lecture	Laboratory or Clerkship	Conference	Total
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FIRST YEAR

Gross Anatomy	85	210	—	295
Embryology and Histology	60	120	—	180
Neuroanatomy	32	56	—	88
Biochemistry	76	180	32	288
Physiology	112	152	32	296
Biostatistics	16	—	—	16
Disaster Medicine	16	—	—	16
Introductory Medical Psychology	16	—	—	16
Psychopathology	16	—	—	16
Total	429	718	64	1,211

SECOND YEAR

Bacteriology	64	144	16	224
Pathology	64	136	32	232
Pharmacology	40	80	24	144
Physical Diagnosis	16	96	—	112
Psychiatry	32	48	—	80
Clinical Microscopy	16	32	—	48
Medicine	48	—	—	48
Surgery	32	—	—	32
Hygiene	32	—	—	32
Pediatrics	32	—	—	32
Neurology	32	—	—	32
Obstetrics and Gynecology	16	—	—	16
Radiology	16	—	—	16
Forensic Pathology and Medical Juris- prudence	16	—	—	16
Dermatology	16	—	—	16
Total	472	536	72	1,080

Subject	Lecture, Conference, or Clinic	Laboratory or Clerkship	Total
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THIRD YEAR

Anesthesiology	16	—	16
Clinical Pathological Conference	16	—	16
Medicine	64	240	304
Medical Laboratory	—	60	60
Neurology	16	60	76
Obstetrics and Gynecology	96	120	216
Ophthalmology	16	—	16
Pediatrics	32	120	152
Physical Medicine	16	—	16
Psychiatry	16	—	16
Radiology	16	—	16
Surgery	112	240	352
Otolaryngology	16	—	16
Admitting and Emergency	—	120	120
Therapeutic Conference	32	—	32
Urology	16	—	16
Total	480	960	1,440

SUMMER CLERKSHIP

Medicine, Surgery, Obstetrics and Gynecology or Pediatrics—eight weeks between third and fourth years.

FOURTH YEAR

Cancer Clinics	—	120	120
Clinical Pathological Conference	28	—	28
Forensic Medicine	12	—	12
Medicine	—	360	360
Obstetrics and Gynecology	—	240	240
Pediatrics	28	240	268
Psychiatry	—	120	120
Public Health Practice	5	—	5
Surgery	—	360	360
Surgical Anatomy	15	—	15
Surgical Pathology	12	—	12
Total	100	1,440	1,540

EQUIPMENT AND FACILITIES

Medical School Building.—The building housing the School of Medicine is a five-story structure with lecture rooms, classrooms, students' rooms, and the following laboratories: anatomy; bacteriology, hygiene, and preventive medicine; biochemistry; pathology; pharmacology; and physiology.

They are fully equipped to enable students to pursue adequately the laboratory courses and to acquire the technical skill necessary in modern clinical and investigative work.

Research and Administration Building.—The Research Building houses special laboratories for graduate and staff research in the departments of Anatomy; Biochemistry; Pharmacology; Physiology; and Bacteriology, Hygiene, and Preventive Medicine. Special facilities are provided for the study of radio-active compounds, for tissue-culture techniques, and for virologic procedures. Selected students are invited to participate in certain aspects of the research program either on a volunteer basis or with the support of special Research Scholarships.

On the first floor, the west wing is occupied by a modern medical library; the east wing houses the administrative offices of the School of Medicine. Photographic laboratories and other facilities for audiovisual aids to education are on the second floor.

Medical Library.—The Medical Library in well-equipped quarters on the first floor of 1339 H Street NW., contains 21,200 carefully selected volumes, including the new medical works and the principal medical journals.

Interlibrary loan service is maintained with other medical and scientific libraries.

The Medical Library is open from 9:00 A.M. to 10:00 P.M. each class day, Monday through Friday, and from 9:00 A.M. to 5:00 P.M. Saturday.

A branch of the Medical Library is maintained in the University Hospital for the use of the resident physicians, interns, and students. It is open Monday through Friday, 1:00 to 5:00 P.M. and 6:00 to 11:00 P.M. During the academic year the library is also open Saturday and Sunday from 1:00 to 5:00 P.M.

The George Washington University Hospital.—This 420-bed hospital is staffed and directed by the Faculty of The George Washington University School of Medicine. It provides excellent clinical opportunity for the instruction of medical students. Practically every specialty in the fields of medicine and surgery has assigned space and equipment in both the outpatient department and the bed-patient section of this modern hospital.

GOVERNMENT MUSEUMS

The Armed Forces Institute of Pathology, on the grounds of Walter Reed Army Medical Center, affords unexcelled opportunity for study of

conditions met in general medicine and surgery as well as those of special military significance. Its collection of anatomical and pathological specimens comprises material received from all areas of the world and is unequaled in this country. The Museum of Hygiene, the National Museum, the Smithsonian Institution, the Botanic Gardens, and the various collections of the Department of Agriculture all afford opportunity for study of materials of special interest in various areas of Medicine and its allied sciences.

CLINICAL FACILITIES

Students at The George Washington University School of Medicine receive clinical training at the University Hospital, at the University Cancer Clinic, and at four affiliated hospitals. In the first year the medical student begins his work in the hospital as well as in the lecture halls and classrooms.

The George Washington University Hospital.—All clinics are under the supervision of the Dean and the chiefs of services. The individual student has direct responsibility to patients under supervision. Clinical and clinical pathological conferences are held in which the history of patients, the physical findings, laboratory records, and the post-mortem pathology, are presented and correlated.

The University Clinics.—The University Clinics have facilities for each Service in the Hospital. Fourth-year students are assigned in rotation by section for instruction in the University Clinics.

The George Washington University Cancer Clinic.—The Helen L. and Mary E. Warwick Memorial building, opened in 1954, houses the Cancer Detection Clinic and special laboratories for research related to the nature, diagnosis, and treatment of cancer.

The facilities of the Cancer Detection Clinic are used for teaching medical students. The diagnosis and treatment of various forms of neoplasms are presented. The results of treatment are evaluated by follow-up studies.

District of Columbia General Hospital.—Washington's large city hospital has 1,172 beds and an outpatient department in which approximately 145,409 patient-visits are made each year. It provides clinical opportunities in every branch of medicine and surgery.

Children's Hospital.—This is one of the largest and best known hospitals for children in the United States. Medical students receive training and clinical experience in pediatrics on both clinic and inpatient services.

St. Elizabeths Hospital.—This hospital cares for 6,425 patients a year with nearly every known psychiatric and neurologic disorder. The George Washington University medical students begin their studies in psychiatry in their first year and these studies continue throughout the

four years. Prominent psychiatrists and neurologists on the St. Elizabeths staff are members of The George Washington University School of Medicine faculty.

Additional clinical experience in psychiatry and neurology is gained by students at The George Washington University Hospital Psychiatric Department and the University Clinics. Special lectures and clinical work in child psychiatry are given in the Psychiatric Department of Children's Hospital.

Mt. Alto Veterans Administration Hospital.—Clinical experience in both medical and surgical subjects is provided at this Veterans Administration hospital.

ADMISSION, REGISTRATION, FEES AND FINANCIAL REGULATIONS

Students in the School of Medicine are subject to, and are expected to familiarize themselves with, the regulations stated on pages 13-30.

Registration in the School of Medicine is for the full academic year. After the student has entered the courses of instruction he is obligated for the full tuition. Acceptance by the School of a student's fee does not in any way obligate the School to accept the student for any subsequent year, and the right is reserved to require the withdrawal of any student from the School whenever, in the interest of the student or the School, the Faculty deems it advisable to do so.

A fee of \$10 to defray the costs of completing the records for final consideration by the Committee on Admissions must accompany each application. This fee applies to students whose premedical training was completed at this University as well as to students who have not previously attended this University. Fees for each semester are payable in advance.

The Committee on Admissions is guided in the selection of students by the applicant's academic ability, the results of the Medical College Admission Test, and personal qualifications as determined by letters of reference and personal interview. Applicants are interviewed only by invitation of the Committee.

Each applicant is notified as soon as possible after the Committee makes a decision.

An applicant who is offered a place in a class is required to notify the Director of Admissions within two weeks of his intent to accept the place reserved for him and to remit a deposit of \$100 not later than January 15th prior to the opening of classes of the academic year for which he applied. This deposit will not be refunded after January 15th. It will be credited toward the tuition for the first semester.

Accompanying the offer of a place in class will be forms for a report on physical condition. This report must be completed and returned to the Director of Admissions by the applicant's physician within two months of receipt of the letter of acceptance.

Credit for work will not be given until, at the completion of a laboratory course, the student has replaced or paid for all articles of equipment or other University property which he has lost, broken, or destroyed. All breakage or loss not directly traceable to an individual student is assessed pro rata.

COST OF TEXTBOOKS AND STUDENT EQUIPMENT

The minimum cost of necessary textbooks and student equipment (microscope, drawing materials, glass slides, clinical thermometer, stethoscope, hemocytometer, uniforms, etc.) is approximately as follows: first year \$500; second year, \$250; third year, \$125; fourth year, \$80; total \$955.

A fee of \$1 a semester is charged for the use (optional) of a locker.

REGULATIONS

Students in the School of Medicine are subject to, and are expected to familiarize themselves with, the general University regulations stated on pages 52-59.

ATTENDANCE

A student is not permitted to attend classes until registration has been completed and fees due have been paid. Regular attendance is required.

GRADES

The following grading system is used *A* (90-100); *B* (80-89); *C* (75-79); *D* (65-74) condition; *E* (below 65) failure; *I* (incomplete), the passing grade in each subject is *C*.

A student conditioned in any subject will not be advanced until such condition is removed and then only by authority of the Faculty.

EXAMINATIONS

Examinations, which may be written, oral, or practical, will be held during and at the end of each semester.

All students in the School of Medicine are required to take Part I and Part II of the National Board Examinations, except that students from those states and foreign countries which do not recognize the National Board may be exempted from Part II by action of the Committee on Scholarship.

PHYSICAL EXAMINATIONS

All first-year students are required to have a comprehensive physical examination within 60 days of admission to the School of Medicine. The students are informed of significant findings and advised regarding such measures as will tend to help them maintain a high standard of health.

In addition medical students benefit from the complete Tuberculosis

Case Finding Program which the School maintains. Under this program all students receive tuberculin tests, X-ray examinations, and such special attention from chest specialists as is necessary to reduce to a minimum the dangers from tuberculosis. Students are immunized against those diseases for which proven prophylaxis exists.

THE DEGREE OF DOCTOR OF MEDICINE

Upon the satisfactory completion of the requirements of the School of Medicine, the degree of Doctor of Medicine is conferred.

COMBINED ARTS AND MEDICINE CURRICULUM

In order to be recommended for the degree of Bachelor of Arts, the candidate must complete, at least 90 semester hours of prescribed college work (at least 30 hours and one year of residence must be completed in Columbian College, the senior liberal arts college), and the first year of the medical curriculum. Upon satisfactory completion of the fourth year of the medical curriculum the student becomes eligible for the degree of Doctor of Medicine.

REQUIREMENTS FOR THE DEGREE

Every candidate for graduation with the degree of Doctor of Medicine must be at least twenty-one years of age, and free of all indebtedness to the University. He must have completed satisfactorily not less than four academic years of study as a matriculated student in Medicine, completed all required courses, and passed satisfactorily all prescribed examinations.

HONORS

A candidate who has completed the four-year medical course with an average grade of 90 or above, may be recommended for graduation "with distinction."

INTERN AND RESIDENT TRAINING PROGRAM

The George Washington University Hospital offers rotating-type internships as classified by the National Intern Matching Program, Inc. Twenty-seven internships of one year each are offered; fourteen in the Department of Medicine with emphasis on medicine, eleven in the Department of Surgery with emphasis on surgery, and two in the Department of Pathology with emphasis on pathology.

Rotating Internships, Emphasis on Medicine.—Interns will be assigned to six months of general medicine, two months on the surgical service, and one month each on neuro-psychiatry, pediatrics, obstetrics and gynecology, and emergency.

Rotating Internships, Emphasis on Surgery.—Interns will be assigned

to the surgical services for nine months, to general medicine for two months, and to obstetrics for one month.

Rotating Internships, Emphasis on Pathology.—Interns will be assigned to the pathology service for six months, to general medicine for two months, to surgery for two months, to pediatrics for one month, and to obstetrics for one month.

Fifty-five approved residencies are offered in anesthesiology, cardiac diseases, internal medicine, neurologic surgery, neurology, obstetrics-gynecology, pathology, pediatrics, physical medicine, plastic surgery, psychiatry, roentgenology, surgery and thoracic surgery. Residency programs are of from one to four years depending upon the service. Appointments are for one year subject to renewal. In several of the fields there are affiliations with local and government hospitals.

Fellowships of one or two years are available to acceptable candidates in anesthesiology, cardiology, chest diseases, infectious diseases, outpatient service, physical medicine, rheumatic diseases, surgery and thoracic surgery.

For application blanks and further information, address the Medical Director, The George Washington University Hospital, 901 Twenty-third Street NW., Washington 7, D. C.

MEDICAL TECHNOLOGY COURSE

This course is open to candidates for the degree of Bachelor of Science in Medical Technology, offered by Columbian College (see page 87), and to other applicants meeting the requirements of the Registry of Medical Technologists of the American Society of Clinical Pathologists. These requirements, fully satisfied by the Columbian College program, are as follows: two years (60 semester hours or 90 quarter hours) of college work in any college or university accredited by a recognized standardizing association, including courses in the biological sciences and in chemistry. The requirement (Effective January 1, 1962 the minimum requirements will be increased to three years of college, 90 semester hours, or 135 quarter hours. Specific science requirements as given hereafter remain the same.) in the biological sciences is satisfied by college courses totaling 12 semester hours (18 quarter hours) in general biology, bacteriology, parasitology, anatomy, histology, embryology, physiology, or zoology; bacteriology is especially recommended. The requirement in chemistry is met by a full year's college course in inorganic chemistry (at least 6 semester hours or 9 quarter hours) plus 3 semester hours in either quantitative analysis, organic chemistry, or biochemistry; quantitative analysis is especially recommended.

In the case of students enrolled in Columbian College for the degree of Bachelor of Science in Medical Technology, the course here described is

to be considered as the final (fourth) year of qualification for the degree. In the case of those who have taken their prerequisite work in some other college or university, satisfactory completion of the Medical Technology Course will not satisfy the requirements for the degree from Columbian College.

The Medical Technology Course consists of 12 months of didactic and practical work in clinical laboratory procedures, offered by the Department of Pathology in the University Hospital. Students ordinarily begin this course with the fall semester, but under exceptional circumstances may begin at other times.

A limited number of scholarships are provided by the University Hospital for students enrolled in the fourth year of the degree program. (See page 41.) All students in this fourth year must provide themselves with uniforms; laundry of uniforms is provided by the University Hospital. A cash allowance of \$65 a month is granted during the last 6 months of the fourth year of training.

Upon satisfactory completion of the course a certificate is awarded and the candidate is eligible for the national certifying examination given by the Registry of Medical Technologists.

Enrollment in the Medical Technology Course is strictly limited so that personal instruction can be given. Acceptance to the Columbian College degree program does not necessarily assure acceptance into the Hospital program. Inquiry about this course should be sent directly to the Department of Pathology, The George Washington University Hospital, Washington 7, D. C.

THE LAW SCHOOL

THE FACULTY AND STAFF OF INSTRUCTION*

C. B. Nutting, *Dean of the National Law Center* (since February 1, 1960); L. H. Mayo, *Acting Dean of the Law School* (to February 1, 1960); C. D. Benson, *Assistant Dean*; E. A. Potts, *Assistant Dean for Development in the Law School*; D. B. Weaver, *Director of Continuing Legal Education*

Professors C. D. Benson, O. S. Colclough, R. M. Cooper, J. F. Davison, W. T. Fryer, W. T. Mallison, Jr., L. H. Mayo, L. S. Merrifield, C. B. Nutting, H. I. Orentlicher, O. H. Walburn, D. B. Weaver, G. E. Westont†; *Adjunct Professors* J. W. Jackson, F. H. Myers; *Professorial Lecturers* E. A. Beard, J. J. Czyzak, Joseph Dach‡, J. L. Edgerton, L. J. Harris, P. F. Herrick, J. A. McIntire, G. E. Monk, L. P. Walsh, C. J. Zinn; *Associate Professors* R. G. Dixon, Jr., J. R. Hambrick; *Associate Professorial Lecturers* T. H. Brown, P. J. Federico, G. J. Goldsborough, H. J. Liebesny, P. A. Rose; *Assistant Professors* W. J. Baker, M. H. Freedman, G. A. Ledakis, J. J. McAvoy, R. J. Temple; *Lecturers* N. E. Allen, M. F. Cohen, S. S. Cohen, J. B. Evans, W. W. Goodrich, H. P. Green, Ephraim Jacobs, Vincent Kleinfeld, E. F. Mullin, Jr., R. C. Nash, Jr., J. A. O'Connell, G. W. Shelhorse, Martin Thaler, H. N. Williams; *Clerk of the Trial Practice Court* J. A. Kendrick; *Associate Clerk of the Trial Practice Court* D. G. Skinker

COMMITTEES §

THE DEAN'S COUNCIL

C. D. Benson, R. M. Cooper, J. F. Davison, W. T. Fryer, L. S. Merrifield, H. I. Orentlicher

COMMITTEE ON ADMISSIONS

C. D. Benson (*Chairman*), M. H. Freedman, E. A. Potts

COMMITTEE ON GRADUATE STUDIES

J. F. Davison (*Chairman*), R. M. Cooper, R. G. Dixon, Jr., G. A. Ledakis, W. T. Mallison, Jr., L. S. Merrifield

* The President of the University, the Dean of Faculties, the Dean of the National Law Center, the Dean and Assistant Dean of the School, the Assistant Dean for Development in the School, the Registrar of the University, the Director of the Admissions of the University, Professors, Adjunct Professors, Associate Professors, and Assistant Professors constitute the Faculty.

This listing of Faculty and Staff of Instruction is for the academic year 1959-60.

† On sabbatical leave spring semester 1959-60.

‡ On leave of absence 1959-60.

§ The Dean of Faculties, the Dean of the National Law Center, the Dean and Assistant Dean of the Law School are members ex officio of all committees.

COMMITTEE ON SCHOLARSHIP

O. H. Walburn (*Chairman*), C. D. Benson, R. M. Cooper

COMMITTEE ON CURRICULUM

H. I. Orentlicher (*Chairman*), W. J. Baker, W. T. Fryer, R. J. Temple, G. E. Weston

LIBRARY COMMITTEE

J. R. Hambrick (*Chairman*), J. J. McAvoy, D. B. Weaver

COMMITTEE ON STUDENT ACTIVITIES

M. H. Freedman (*Chairman*), J. J. McAvoy, H. I. Orentlicher, O. H. Walburn

GENERAL INFORMATION

LOCATION IN THE NATION'S CAPITAL

The George Washington University Law School, now in its 95th year, is the oldest law school in the District of Columbia. The School took part as a charter member in 1900 in the organization of the Association of American Law Schools and it has been an active member of the Association since that time. It is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association.

National University, which had had an important place in legal education in the District of Columbia since 1869, was merged into The George Washington University in August 1954.

Of special significance is the location of the Law School in the Nation's Capital, the focal point of the law in action, both American and international. The work of the School goes on in this environment, presenting a unique opportunity for observation and study of federal agencies—judicial, legislative, and administrative.

The years of residence at law school are years of participation in the life of the community, which in the case of the George Washington University Law School, is the government of the United States by law. As a consequence, the study of law takes on added meaning, whether the goal be government service or practice, general or specialized.

OBJECTIVES

The primary purpose of the Law School is to prepare men and women to meet the needs of society in the many fields of law, public and private. These needs call not only for technical skill but also for responsible leadership in the development of the law and the administration of justice. In fulfilling these responsibilities the Law School offers: (1) a program of study in preparation for the practice of law; (2) programs of study and research on the graduate level for foreign as well as for American

students; (3) a continuing legal education program for members of the bar; (4) institutes and forums on current topics in domestic and foreign law; (5) the publication of a law journal containing the results of research in public law; and (6) the encouragement of student professional co-curricular activities.

PROGRAMS OF STUDY

Traditionally the Law School has been national in the geographic distribution of its students. At the present time, men and women holding baccalaureate degrees from more than three hundred colleges and universities come from the fifty states and several foreign countries to comprise the student body. As a consequence the programs of study leading to the degrees of Bachelor of Laws and Juris Doctor have been planned to provide instruction and training for the practice of law wherever the Anglo-American legal system obtains.

Graduate work leading to the degrees of Master of Laws and Doctor of Juridical Science is offered for those desiring further study and research in specialized fields of law.

Provision is made for advanced study by members of the bar who do not desire to register as candidates for degrees. Lawyers may take courses for this purpose either as unclassified graduate students or as continuing legal education students.

Graduate work is offered also to meet the needs of lawyers who come from countries whose legal systems are not based on the English law. There are two programs of study, one leading to the degree of Master of Comparative Law for lawyers planning to return to their own countries, and the other leading to the degree of Master of Comparative Law (American Practice) for lawyers planning to remain in this country for the practice of law.

ORGANIZATION OF THE CURRICULUM

The curriculum is organized so that students may enter the Law School at the beginning of the fall or spring semester of the academic year, or at the beginning of the summer term.

MORNING AND EVENING DIVISIONS

Most morning classes meet for fifty-minute periods between 9:10 A.M. and 1:00 P.M., Monday through Friday; a few classes and Trial Practice Court meet for two-hour periods on Saturday morning.

Evening classes meet for two fifty-minute periods from 5:50 to 7:40 P.M., Monday through Friday. A four-credit course, e.g., Torts, meets two evenings a week; a two-credit course, e.g., Personal Property, meets one evening a week. The evening division conforms to the standards of the morning division, the full-time faculty participating in the instruction.

THE LIBRARY

The Law Library of 55,200 volumes contains the official reports of the decisions of the courts of last resort of all states prior to the National Reporter System, and of some states complete to date; the National Reporter System, complete; the reports of the United States Supreme Court and lower federal courts, and the reports of federal administrative agencies; Shepard's Citations for the units of the Reporter System; the English Reports, Full Reprint; the English Law Reports; the Times Law Reports; the Dominion Law Reports; the United States statutes and codes; complete sets of statutes of all the states; the English statutes; the principal English and American digests and encyclopedias; collections of special reports and annotated cases; United Nations documents; and leading textbooks and treatises. Approximately 325 legal periodicals are currently received. A section of the library, consisting of books acquired from National University, is known as the National University Law Collection.

Also available to law students are 50,000 bound volumes and 20,000 pamphlets of the former library of the Carnegie Endowment for International Peace, in the fields of international law and relations, history, and economics, in the University Library.

The Law Library, which is on the fourth floor of Stockton Hall, is open from 9:00 A.M. to 10:00 P.M., Monday through Friday; from 9:00 A.M. to 5:00 P.M. on Saturday; and from 2:00 to 6:00 P.M. on Sunday. Books and other materials do not circulate and must be used in the library.

THE LAW REVIEW

The George Washington Law Review, published by the University, is edited and managed by students of the Law School under the supervision of faculty advisers. It is devoted exclusively to state and federal public law. The location of the University in the National Capital, where the primary sources of federal public law may be observed in operation, affords an unexcelled opportunity for specialization in this field.

The *Review* organization includes a faculty editor-in-chief, an associate faculty editor, a faculty board of advisory editors, a board of departmental advisory editors, and a board of student editors. The student editors are chosen each year on the basis of scholarship from full-time and part-time students.

THE STUDENT BAR ASSOCIATION

Every student in the Law School is a member of the Student Bar Association, which is organized to enable students to become better acquainted with problems of the profession, to foster professional ideals, and to bring about closer contact with members of the profession engaged in active

practice of the law. The work of the Student Bar Association is carried on by various committees and by group and general meetings of a professional and social nature. From time to time lectures are given by outstanding authorities on legal and professional problems.

An important activity is the Van Vleck Case Club Competition, which provides an opportunity for training in appellate advocacy. First and second year students participate as contestants before courts composed of members of the Faculty and the local bar. Senior law students of the Case Club also sit as judges. The final argument is held before a court composed of distinguished federal judges.

The Legal Aid Program is under the joint sponsorship of the George Washington University Student Bar Association and the Junior Bar Section of the District of Columbia Bar Association. Participating students assist court-appointed attorneys in the preparation of cases for trial or appeal. Qualified second- and third-year students are eligible for participation in the program.

In the ranking of member associations by the American Law Student Association, the George Washington University Student Bar Association has received first place twice and second place twice in the past five years.

ORDER OF THE COIF

The Order of the Coif, a national honor society with chapters in over forty law schools, aims "to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship." The George Washington University Chapter was established in 1926. Members are elected each year from the highest-ranking 10 per cent of the graduating class of the Law School.

REGULATIONS

Students in the Law School or subject to, and are expected to familiarize themselves with, the following regulations and the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 13-30, and the University regulations stated on pages 52-59.

AMOUNT OF WORK

Students without substantial outside employment may take a program of studies of 14 hours a week. Such students may take courses in the evening only if they are not available in the morning and if a majority of the hours taken are in morning courses. Students, whether in the morning or evening division, with substantial outside employment must take a limited program of studies not exceeding 10 hours a week. Students taking a majority of their classes in the evening may not take more than 10 hours a week. A minimum schedule of 10 hours in the morning division and 6 hours in the evening division is required except in exceptional

circumstances when a reduced program is authorized by the Dean for continuing students.

ATTENDANCE

Regular attendance at classes is required and is necessary for successful work. A student who is deficient in class attendance in any course may be barred from taking the examination.

RESIDENCE REQUIREMENTS

Candidates for the degree of Bachelor of Laws must complete a residence period of three academic years. Attendance in the morning division for the fall and spring semesters constitutes residence for an academic year; similar attendance in the evening division constitutes residence for three-fourths of an academic year. Consequently, a morning student must attend 6 semesters to meet residence requirements; an evening student must attend 8. Students authorized to take schedules of less than 10 hours in the morning division or less than 6 hours in the evening division receive residence credit on a proportional basis. Students who attend the summer sessions receive fractional residence credit.

Students planning to attend summer school sessions at other law schools and desiring to use credits obtained at such schools in their course at this Law School must first have the courses they wish to take approved by the Dean. In no event will credits be recognized in excess of those which might be obtained in a similar period in this School.

EXAMINATIONS

Written examinations are held at the end of each course. Every student is required to take the regular examinations unless excused. No excuse for absence will be granted except by the Dean and then only for illness or other emergency. Application for excuse must be made in writing not later than one month after the date of the examination. An entry of *NG* (no grade) will be made on the record of a student thus excused. To receive credit for the course, he must take the next regularly scheduled examination.

Permission to take an examination before the regularly scheduled date will not be granted. Permission to take a postponed examination is limited to the situation provided for in the preceding paragraph.

A special examination will be granted only to a student entitled to take a postponed examination, who is a candidate for a degree to be conferred at a convocation which precedes the next regular examination in the subject. Written application, showing sufficient cause, should be addressed to the Dean, and approval will be granted at the discretion of the Faculty.

If a student fails to take an examination, a grade of *F* (to be counted as zero) will be recorded unless he has been excused from the examina-

tion as provided above or has obtained the Dean's permission to drop the course.

GRADES

Grades are indicated by the letters *A*, excellent, 85-100; *B*, good, 75-84; *C*, satisfactory, 65-74; *D*, poor, 55-64—below standard for graduation; *F*, failed—below 55; and *I*, incomplete—student excused from failure to take regularly scheduled examination. See "Examinations" above, for grade upon failure to take an examination. The grades *A*, *B*, *C*, and *D* mean that the work has been completed and credit given for the courses. *D* grades, however, do not represent satisfactory work and adversely affect a student's cumulative average. *F*, failed, means that no credit will be given.

A student may not repeat a course he has failed except by permission of the Faculty.

The cumulative average of a student includes all the grades in all the courses taken while he is in the Law School as a candidate for a particular degree. When a course is repeated, both the first grade and the subsequent grade or grades are counted in the cumulative average.

EXCLUSION AND PROBATION FOR POOR SCHOLARSHIP

Candidates for the Degrees of Bachelor of Laws and Juris Doctor.—A student will be excluded who fails in courses aggregating 8 or more semester hours in one semester or in two successive semesters, or who fails in courses aggregating 10 or more semester hours during his period of law study. A student subject to exclusion under this provision who is currently registered will be permitted to complete the work of the semester.

A student not subject to exclusion under the foregoing rule who at any time fails to maintain a cumulative average of at least *C* will be placed on probation. A student on probation may at the discretion of the Dean be required to reduce his program of study. If a student on probation does not, by the end of the second semester following that in which his average has fallen below *C*, receive grades sufficient to give him a cumulative average of at least *C*, he will be excluded. If a student on probation attains a cumulative average of at least *C* by the grades received during the semester his status will then become clear. A maximum of three semesters of probation is allowed. Thus, if a student whose status has become clear after two semesters of probation subsequently goes on probation, he will be allowed only one semester of probation in which to raise his average to at least *C*.

In special cases in which a student who has been excluded can clearly demonstrate that his low grades were due to special circumstances beyond his control and that he has the capacity to pursue the study of law with

a definite likelihood of success, such student may be readmitted by the Faculty subject to such conditions as the Faculty may impose.

Candidates for Graduate Degrees.—A candidate for one of the graduate degrees whose work is not satisfactory in the opinion of the Faculty, taking into consideration the requirements and standards for the degree, may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

Unclassified Students.—An unclassified student whose work is not satisfactory in the opinion of the Faculty may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

CLASSIFICATION OF STUDENTS

Candidates for the degree of Bachelor of Laws are divided into classes on the completion of semester hours as follows: (1) full-time students: first year, 1-28; second year, 29-56; third year, 57 or more; (2) part-time students: first year, 1-20; second year, 21-40; third year, 41-60; fourth year, 61 or more.

THE DEGREES OF BACHELOR OF LAWS AND JURIS DOCTOR

The programs of study leading to the degrees of Bachelor of Laws and Juris Doctor are addressed to the development and application of legal principles, skills, and ideals which are indispensable to the equipment of a lawyer for professional responsibility and leadership in modern society. They include, first and foremost, the traditional core of legal education, namely, the study of legal materials—judicial, statutory, and administrative—and instruction in the understanding and technique of their use. These programs include the study of the nature and purpose of law, the history of the Anglo-American legal system, and the history and standards of the legal profession; practice in the skills of legal research and legal writing; elementary training in trial practice; and, through the medium of seminars, experience in group handling of legal problems.

REQUIREMENTS FOR THE DEGREES

BACHELOR OF LAWS

To be recommended for the degree of Bachelor of Laws (LL.B.) the student must have completed a residence period of not less than three academic years (four years for evening students) and 80 semester hours, with a cumulative average of at least *C*. At least one academic year of residence and 28 semester hours are required of students admitted with advanced standing. Credits allowed by way of advanced standing are not included in computing the average required for graduation.

JURIS DOCTOR

The degree of Juris Doctor (J.D.) is conferred as a recognition of the completion at the George Washington University Law School, with high rank, of the required program of study for the Bachelor's degree, including experience in research and legal authorship. To be recommended for this degree the student must have completed: (1) a residence period of not less than three academic years (four years for evening students); (2) 80 semester hours with a cumulative average of at least *B* including one of the following courses: Comparative Law I, Jurisprudence, or one of the graduate seminars; and (3) one year of acceptable service on the board of student editors of *The George Washington Law Review*, election to which is subject to regulations laid down by the Faculty. All requirements for the degree must be completed at this Law School.

HONORS

The degree of Bachelor of Laws or of Juris Doctor "with distinction" will be awarded students who obtain a cumulative average of *A*.

CURRICULUM

Required and Elective Courses.—A program of required and elective courses has been developed in order to assure coverage of the basic courses as well as to allow a degree of flexibility to meet the diverse interests of students. All first-year courses, four second-year courses, and one third-year course are required, leaving a total of 34 hours of electives. In general, second-year students are restricted to second-year electives but in appropriate cases the taking of third-year electives will be approved. Similarly, specially qualified third-year students may secure approval to take graduate courses and research in public law. It is important that students plan ahead regarding their electives.

Practice and Trial Practice Court.—Classroom instruction is conducted in pleading and procedure, trial and appellate practice, and evidence. This instruction includes grounding in the principles of the Federal Rules of Civil Procedure and the Federal Rules of Criminal Procedure. In addition, each senior student is required to participate in the work of the Trial Practice Court, which includes the trying of cases as junior counsel and as senior counsel. A special section of the court is devoted exclusively to the trial of patent cases. Experience in preparing and arguing appellate court cases is available through the Case Club Competition.

Patent Law.—Students interested in patent law should take the following group of courses: Unfair Trade Practices, Patent Law I and II, Patent Office Practice, Patent Trial Practice Court, Federal Antitrust Laws, and Trade Regulation Seminar.

Curriculum.—Following is the curriculum for students beginning in the fall semester. Adjustments are made to meet the needs of students beginning in the spring semester and in the summer.

Morning Division

FIRST YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Contracts I	4	Constitutional Law	4
Legal Method and Legal System..	4	Contracts II	2
Personal Property	2	Criminal Law and Procedure	4
Torts	4	Real Property	4
Total.....	14	Total.....	14

SECOND YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Civil Procedure	4	Administrative Law	4
Conveyances	2	Evidence	4
Electives	8	Electives	6
Total.....	14	Total.....	14

THIRD YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Trial Practice Court	2	Trial Practice Court	2
Electives	10	Electives	10
Total.....	12	Total.....	12

Evening Division

FIRST YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Contracts I	4	Contracts II	2
Legal Method and Legal System..	4	Criminal Law and Procedure....	4
Personal Property	2	Torts	4
Total.....	10	Total.....	10

SECOND YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Civil Procedure	4	Constitutional Law	4
Real Property	4	Conveyances	2
Elective	2	Electives	4
Total.....	10	Total.....	10

THIRD YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Administrative Law	4	Evidence	4
Electives	6	Electives	6
Total.....	10	Total.....	10

FOURTH YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Trial Practice Court	2	Trial Practice Court	2
Electives	8	Electives	8
Total.....	10	Total.....	10

GRADUATE PROGRAM

DEGREES OF MASTER OF LAWS AND DOCTOR OF JURIDICAL SCIENCE

The administration of justice under law is a matter so vast and complex that some graduates feel the need for further study in order to broaden and deepen their understanding of the law. Others wish to extend their study into rapidly developing specialized fields. Graduate instruction, leading to the degree of Master of Laws, is therefore offered to enable qualified students to attain one or both of these objectives.

The degree of Doctor of Juridical Science is offered for selected students whose aim is to extend still further their studies by pursuing original research in law.

Graduate work is available to evening as well as morning students in order that lawyers in private practice and in government service may engage in advanced study or in original research.

PROGRAMS OF STUDY FOR FOREIGN LAWYERS

Two programs of study are provided to meet the needs of lawyers who come from countries whose legal systems are not based on the English law. For such lawyers, whose aim is to acquire an understanding of our system so that they may work intelligently with its materials and practitioners after returning to their own countries, there is available the degree of Master of Comparative Law. For foreign lawyers, however, who wish to practice in a common law jurisdiction there is available the degree of Master of Comparative Law (American Practice) with an appropriate and more intensive program of study. With respect to both programs, the students are not assigned to special classes but work in association with the other students in the regular courses, each student's program being adapted to his individual needs.

NONDEGREE STUDY: CONTINUING LEGAL EDUCATION

An important part of the graduate program is the offering of courses in various fields of the law for members of the bar not interested in degree candidacy but desirous of keeping abreast of current developments. The offerings in the field of governmental regulation provide opportunities for specialization. Although third-year and graduate courses are particularly suitable, first-year and second-year courses may be taken in appropriate

cases. Members of the bar taking graduate work in this way register as unclassified students or as continuing legal education students.

RESEARCH IN PUBLIC LAW

Research in public law is conducted under the supervision of members of the Faculty. The purpose of this research is to furnish means for training specialists in public law, either as government lawyers or as lawyers representing individuals or corporations in cases in which the Government is a party, and to assist in the analysis, clarification, formulation, and improvement of public law, substantive and procedural.

Candidates for the graduate degrees in the Law School and specially qualified seniors may pursue this work.

REQUIREMENTS FOR THE DEGREES

MASTER OF LAWS

To be recommended for the degree of Master of Laws (LL.M.) the student must have completed a residence period of not less than two semesters. Such residence should normally be continuous. All requirements for the degree must be completed in this Law School and in a period not exceeding two years after registration for work for the degree. The student must have completed, with a minimum average of *B*, 20 semester hours in courses listed in the law curriculum as graduate courses except that in appropriate cases third-year courses may be approved for inclusion in the program of study if not previously taken.

MASTER OF COMPARATIVE LAW

The degree of Master of Comparative Law (M.Comp.L.) is for foreign students who intend to return to their countries. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed satisfactorily 24 semester hours in approved courses in the curriculum of the Law School or of such other departments of the University as the Faculty of the Law School shall approve.

MASTER OF COMPARATIVE LAW (AMERICAN PRACTICE)

The degree of Master of Comparative Law, American Practice (M.Comp.L.(Am.Prac.)) is for foreign students who intend to remain in this country. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed 28 semester hours in approved courses in the curriculum of the Law School with a cumulative average of at least *C*.

DOCTOR OF JURIDICAL SCIENCE

To be recommended for the degree of Doctor of Juridical Science (S.J.D.) the student must have completed a residence period of not less

than one academic year. He must have pursued a course of study and research designated by his consultative committee and approved by the Committee on Graduate Studies. At the conclusion of his first year of residence, or at such other time as the Committee on Graduate Studies may set, the candidate must pass an oral examination in those fields of study selected by the consultative committee. This examination shall be conducted by the consultative committee and such other members of the Faculty and qualified experts as may be selected by the Committee on Graduate Studies.

No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary. It is the responsibility of the candidate for a Doctoral degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the dissertation, which are rigidly enforced. To be acceptable the dissertation must, in the opinion of the examining committee, constitute a substantial contribution to the field of law concerned and be suitable for publication. Additional information will be supplied by the Chairman of the Committee on Graduate Studies.

The summaries of accepted dissertations will be printed in a numbered issue of the University BULLETIN. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

THE SCHOOL OF ENGINEERING

THE FACULTY AND STAFF OF INSTRUCTION*

M. A. Mason, *Dean*; C. H. Walther, *Assistant Dean*; J. E. Walters, *Director, Engineering Administration Program*

Professors N. B. Ames||, Ernest Frank, R. A. Hechtman, M. A. Mason, F. M. Mears, R. H. Moore, C. R. Naeser, Lewis Slack, J. E. Walters, C. H. Walther; *Professorial Lecturers* H. J. Barnett, K. S. Colmen, J. N. Davis, F. C. Dyer, F. P. Hall, K. C. Harder, F. K. Harris, Laurence Heilprin, Robert Kahal, F. M. Reynolds, R. I. Sarbacher, Nathaniel Stewart, H. L. Stier, Sanford Thompson, George Tyler, R. J. Wilson; *Associate Professors* G. M. Arkilic, P. A. Crafton, Louis dePian, R. R. Fox, N. T. Grisamore, H. H. Hobbs, John Kaye, T. P. G. Liverman, A. C. Murdaugh, B. D. Tillett, G. C. Weaver||, D. G. White†; *Assistant Professors* R. L. Dedrick, J. F. Greenslade, R. A. Hemmes, R. S. Ledley, M. H. Moore, Jr., P. S. Morgan, Jr., L. A. Rubin; *Lecturers* George Abraham, William Alderson, W. W. Balwanz, M. A. Garstens, K. M. Lovewell, J. R. Miles, Sr., R. E. Moffat, George Pida, L. S. Rotolo, P. H. Sawitz, D. E. Shytle; *Instructor* C. D. Ferris; *Associates* D. C. Rohlfs, W. R. Smith III

COMMITTEES‡

THE DEAN'S COUNCIL§

1961: R. A. Hechtman, C. R. Naeser; 1962: A. C. Murdaugh, J. E. Walters; 1963: P. A. Crafton, N. T. Grisamore

COMMITTEE ON ADMISSION AND ADVANCED STANDING

C. H. Walther (*Chairman*), R. R. Fox, P. S. Morgan, Jr., L. A. Rubin

COMMITTEE ON SCHOLARSHIP

R. R. Fox (*Chairman*), C. D. Ferris, R. A. Hemmes, M. H. Moore, Jr.

*The President of the University, the Dean of Faculties, the Dean of the School and the Assistant Dean in the School, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty.

†This listing of the Faculty and Staff of Instruction is for the academic year 1959-60.

‡On sabbatical leave spring semester 1959-60.

§The Dean of the School and the Assistant Dean in the School are members ex officio of all committees. Membership of committees listed here is for the academic year 1959-60.

||Elected by the Faculty.

‡Deceased.

COMMITTEE ON GRADUATE STUDIES*

P. A. Crafton (*Chairman*), Louis dePian, N. T. Grisamore, R. A. Hechtman, T. P. G. Liverman, C. R. Naeser, J. E. Walters, K. Harder (*Liaison Member*), R. J. Wylde (*Liaison Member*)

COMMITTEE ON RESEARCH

N. T. Grisamore (*Chairman*), G. M. Arkilic, R. L. Dedrick, R. S. Ledley, A. C. Murdaugh

GENERAL INFORMATION

INTRODUCTORY

The School of Engineering was organized in 1884 as the Corcoran Scientific School. In 1903 that school was combined with Columbian University in the Department of Arts and Sciences. In 1905 the engineering courses were placed under an administrative organization known as the Washington College of Engineering, and in 1909 the name was changed to the College of Engineering and Mechanic Arts. In 1914 the name became the School of Engineering.

Curricula leading to the degrees of Bachelor of Civil Engineering, Bachelor of Mechanical Engineering, and Bachelor of Electrical Engineering are accredited by the Engineers' Council for Professional Development, the recognized accrediting body of the engineering profession.

OBJECTIVE

The objective of the School of Engineering is to produce graduates who possess knowledge and understanding of the fundamental scientific principles in their fields of study; some skill in their application; and an attitude of responsibility toward society and the engineering profession.

ORIENTATION PROGRAM†

Students in the School of Engineering participate in the Orientation Program of the University, which is held during the week preceding registration for the fall semester. Events of the program include an advising period when members of the Faculty and academic advisers in the School of Engineering are available for personal interviews to assist students in planning their programs to best prepare them for ultimate goals; an Orientation Assembly, required of all new students; a Curriculum Assembly, for guidance in the selection of courses for the coming semester; placement tests for new students who do not have advanced standing in mathematics and English; qualifying examinations for students who wish to waive curriculum requirements or qualify for ad-

* Appointed by the Dean upon recommendation of the Faculty.

† See the calendar for dates of scheduled events.

vanced standing; scheduled social events; and the opportunity to discuss with older students and with staff members concerned with student activities the extracurricular program of the University, so that a wise and rewarding selection may be made.

The placement tests are required and are scheduled during Orientation week for students entering the School of Engineering, and again during the week prior to the spring registration for students entering at that time, so that the results will be available to students and advisers before registration as a guide to class placement. Students shown by the results of placement tests to be inadequately prepared are advised to take remedial work before undertaking Engineering curriculum courses in areas of deficiency.

PROGRAMS OF STUDY

Programs of undergraduate study are offered leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering (with optional areas of concentration).

Graduate work is offered under the supervision of the Committee on Graduate Studies, leading to the degrees of Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

ADVISORY SYSTEM

Every student entering the School of Engineering as an undergraduate degree candidate is assigned a permanent Faculty adviser—for the purpose of guiding the educational career of the student, providing assistance in his professional development as an engineer, establishing close relations between the Faculty and the student, and furnishing counsel and advice in all phases of the academic career of the student.

Faculty advisers counsel students on their programs of study, the achievement and maintenance of satisfactory scholastic performance, professional development, extracurricular activity as part of the educational process; and assist the entering student to orient himself within the engineering discipline. The adviser represents the student in all cases requiring Faculty action.

Students who have not completed 70 semester hours satisfactorily are required to obtain their advisers' approval of programs of study prior to registration.

A student who has not completed the course work specified for the freshman and sophomore years is required to consult his adviser when so directed by the Dean, and to follow the recommendations of his adviser in all academic matters. However, advisers may not deny a student entry into any course or activity to which he is entitled under the regulations of the School of Engineering. Students having junior or senior status are encouraged to consult their advisers. The Dean acts as temporary

adviser to entering or transfer students pending assignment of their permanent advisers.

All students are encouraged to discuss college problems with their advisers or instructors at any time; and parents or guardians are invited to consult with the Dean and advisers, concerning any student problems.

Faculty advisers discharge their counseling duties in accordance with the high principles of their professional responsibility; however, the final responsibility for a student's action lies wholly with the student.

REGULATIONS

Students in the School of Engineering are subject to, and are expected to familiarize themselves with, the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 13-30, and the University regulations stated on pages 52-59.

AMOUNT OF WORK

A full-time undergraduate student who is not on probation may take not more than 20 semester hours. A student employed more than 24 hours a week, who is not on probation, may take not more than 10 semester hours.

A student previously unemployed who accepts employment subsequent to registration or at any time during a semester is required to report that fact immediately to the Dean, in order that adjustments in schedule may be made, if necessary, to bring his program within the Faculty's limitations upon the amount of work to be carried by an employed student.

ATTENDANCE

A student may not attend classes until registration has been completed and fees due have been paid. A student may be dropped from any course for undue absence.

A student suspended for any reason may not attend classes during the period of suspension.

The student is expected to attend every meeting of the course in which he is registered, fully prepared to carry on the work required. The student is held responsible for all work in the course, and all absences must be excused before provision will be made for him to make up the work missed. Excuses for absences from examinations which have been announced in advance can be obtained only by making written application to the instructor in charge of the course.

CHANGES IN PROGRAM OF STUDIES

In addition to the general University regulations on pages 54-55, the following regulations apply to students in the School of Engineering:

During the seven days following the first day of classes of a semester,

additional courses may be added to the student's program with the approval of the instructor, the student's adviser, and the Dean.

No change in program may be made, without academic penalty, after the fourteenth day following the first day of classes of a semester, except in exceptional cases when the Dean, upon recommendation of the Committee on Scholarship, may approve withdrawal from *all courses*. Written request for such withdrawal, stating satisfactory reasons, should be addressed to the Dean.

Unauthorized withdrawal from a course at any time entails a penalty of failure in the course and financial responsibility for the full fee for the course.

CREDIT

Credit toward a degree is given only after regular registration for and satisfactory completion of the required work of classes in the University, or upon the granting of advanced standing in accordance with the regulations of the School. A student who takes a course as an auditor may not take the same course later for credit.

HONORS LIST

The Faculty of the School of Engineering recognizes meritorious scholastic achievement by an Honors List, containing in alphabetical order the names of candidates for undergraduate degrees in engineering, whose scholastic achievement satisfies all of the following requirements:

1. The candidate's cumulative quality-point index is equal to or exceeds 3.00.
2. At least thirty semester hours of credit have been earned while a degree candidate in the School of Engineering.
3. At least fifteen (part-time student) or thirty (full-time student) semester hours of credit in an engineering degree curriculum have been earned in the two semesters immediately preceding the award.
4. No grade below *C* has been received during the qualifying period stated above.
5. No disciplinary action has been taken in respect to the student.

The Honors List is prepared at the end of the fall and spring semesters and displayed in an appropriate public place in the School of Engineering. A notation is made on the student's record each time his name is included in an Honors List.

THE BACHELOR'S DEGREES

The Bachelor's degrees are Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering.

The degree of Bachelor of Science in Engineering may be earned with

any of the following options: Chemistry, Engineering Administration, Machine Computer, Mathematics, or Physics.

Curricula leading to the degrees of Bachelor of Civil Engineering, Bachelor of Mechanical Engineering, and Bachelor of Electrical Engineering are accredited by the Engineers' Council for Professional Development, the recognized accrediting body of the engineering profession.

REQUIREMENTS FOR THE DEGREES

SCHOLARSHIP

A student must maintain a quality-point index of at least 2.00 to be in good academic standing. A student who fails to maintain the scholarship requirements of the School of Engineering may be dismissed from the University.

In order to graduate, a student must have a quality-point index of at least 2.00 in all work taken at The George Washington University and accepted in the School of Engineering. Passing grades are essential in required courses in Physical Education, but the grades so earned are not included in the quality-point index.

Mid-semester Warning.—At the end of the seventh week of each semester, instructors report to the Dean the names of those students whose scholarship is tentatively deemed unsatisfactory. A warning notice is sent to the student and a copy to his adviser. A student who receives warning notices is required to consult his instructor and his adviser immediately.

The adviser may prescribe diagnostic tests and/or remedial study to be completed before the end of the current semester.

Probation.—A student whose quality-point index falls below 2.00 will be placed on probation. This probation will extend over the period in which the student attempts twelve semester hours of study. In certain circumstances the period of probation may be extended.

A student on probation is required to follow a program of study, including remedial studies if necessary, prescribed by the Committee on Scholarship. A student on probation may not hold office or participate in the activities of any student organization or represent the School in any student activity.

Suspension.—A student whose quality-point index is below 2.00 at the end of his probationary period will be suspended. A student whose quality-point index falls below 2.00, after he has once been removed from probation, will be suspended.

At the time of his suspension a student may apply to the Committee on Scholarship for guidance concerning remedial action he should take during the period of his suspension.

A student suspended for poor scholarship may apply* to be readmitted

* Application for readmission should be made two months in advance to permit the taking and grading of readmission tests.

in the semester or summer session which begins next after an interval of one calendar year. To be considered for readmission he will be required to pass tests or examinations prescribed by the Committee on Admission and Advanced Standing. No advanced standing will be assigned for any course work taken during the period of suspension. A student readmitted after suspension will be on probation. He will be required to maintain a current quality-point index of at least 2.50 on each 12 semester hours of work undertaken until his cumulative quality-point index is 2.00. In no case will the probationary period after readmission exceed 24 semester hours of study. A student suspended twice for poor scholarship will not be readmitted.

The foregoing scholarship regulations are applied when a student has completed a minimum of 12 semester hours of work. Thereafter, the regulations are applied in multiples of 12 hours.

USE OF CORRECT ENGLISH

Any student whose written or spoken English in any course whatever is deemed unsatisfactory may be reported by the instructor to the Dean's Council. The Council may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up any such deficiency in English to the satisfaction of the Dean's Council.

RESIDENCE

For the Bachelor's degrees, a minimum of one year or 36 semester hours must be completed in residence. Summer work may be counted in residence, but in no case may the period of residence aggregate less than 30 weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior or final year must be completed in residence.

CURRICULUM REQUIREMENTS

The satisfactory completion of one of the following curricula is required.

Physical Education is required of all students in the freshman and sophomore years. (See "Physical Education Requirements", pages 55-56.)

Variations from the prescribed curricula may be made, with the permission of the Dean's Council. A student desiring to omit a required course and substitute another must make written application to the Dean presenting satisfactory reasons for the substitution; written approval must

be obtained and the required fee paid before registration for the course.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status, see pages 56-57.

FRESHMAN YEAR (FOR ALL ENGINEERING CURRICULA)*

	Semester Hours
Chem. 11-12	8
†Eng. 1	3
Math. 12	3
Math. 29, 30, 31	9
ME 9	3
ME 10	2
Phys. Ed.	See pages 55-56 for statement of requirement.
Phys. 11	3
Phys. 14	3
General Chemistry	3
English Composition	3
Analytic Geometry	3
Calculus I, II, III	9
Introduction to Engineering	3
Graphical Communication	2
See pages 55-56 for statement of requirement.	
Introductory Physics	3
General Physics	3
Total	34

ROTC.—Air Force ROTC students substitute Air Science 1-2 and 21-22 (6) for Physical Education 1-2 (2), and may postpone English 1 until the sophomore year.

SOPHOMORE YEAR (FOR ALL ENGINEERING CURRICULA)

	Semester Hours
CE 21	3
CE 24	3
EE 11	3
EE 12	3
Eng. 2	6
Math. 111, 112	6
Phys. Ed.	See pages 55-56 for statement of requirement.
Phys. 15, 16	3
†Elective	3
Elective	6
Rigid Body Mechanics I	3
Strength of Materials	3
Electric Circuits	3
Electric Machinery	3
English Composition	6
Mathematics for Engineers and Physicists I, II	6
See pages 55-56 for statement of requirement.	
General Physics	3
In humanities or social studies	3
In humanities or social studies (see page 137)	6
Total	36

ROTC.—Air Force ROTC students substitute Air Science 11-12 and 51-52 (6) for physical Education 11-12 (2) and Elective (3).

Bachelor of Civil Engineering

JUNIOR YEAR

	Semester Hours
CE 112	3
CE 121	3
CE 125	4
CE 132	3
CE 143-44	8
EE 102	3
ME 113	3
Surveying	3
Rigid Body Mechanics II	3
Engineering Materials	3
Fluid Mechanics	3
Structural Theory I-II	3
Engineering Electronics	3
Thermodynamics I	3

* Exceptional students may qualify for admission to advanced courses by successfully completing qualifying examinations.

† Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both semesters of the English Composition course; those who are inadequately prepared are assigned to English 1x.

‡ B.E.E. candidates may elect Speech 1, English 11, or Psychology 1.

ME 118
Elective

	Semester Hours
Heat Transfer	3
In humanities or social studies (see page 137).....	4
Total.....	34

SENIOR YEAR

	Semester Hours
CE 128 Soil Mechanics	3
CE 135 Hydraulic Engineering	3
CE 137 Applied Earth Sciences.....	3
CE 145 Metal Structures	3
CE 146 Reinforced Concrete	3
CE 154 Structural Dynamics	3
CE 157 Mechanics of Deformable Bodies.....	3
CE 165 Engineering Planning and Organization.....	3
CE 168 Regional and Urban Planning.....	3
Elective In humanities or social studies (see page 137).....	6
Elective Technical Elective	3
Total.....	36

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for Elective (6).

Bachelor of Electrical Engineering

JUNIOR YEAR

	Semester Hours
CE 121 Rigid Body Mechanics II.....	3
CE 132 Fluid Mechanics	3
EE 102 Engineering Electronics	3
EE 103 Electric and Magnetic Fields.....	3
EE 104 Field Analysis	3
EE 107 Steady-state Network Analysis	3
EE 111, 112 Electrical Measurements	4
EE 113 Electric Power Laboratory	2
EE 122 Measurements and Electronics Laboratory.....	2
Phys. 116 Quantum and Solid State Physics.....	3
Elective In humanities or social studies (see page 137).....	5
Total.....	34

SENIOR YEAR

	Semester Hours
EE 114 Electric Power Laboratory.....	2
EE 118 Electrical Energy Conversion.....	3
EE 123 Electronic Devices and Systems Laboratory.....	2
EE 124 High-frequency Communications Laboratory.....	2
EE 127 General Network Analysis.....	3
EE 133 Engineering Analysis	3
EE 136 Electromagnetic Waves	3
EE 137 Electronic Circuits and Systems.....	3
EE 171 Digital Circuitry and Systems.....	3
EE 189-90 Proseminar in Electrical Engineering.....	2
ES 154 Automatic Control	4

		Semester Hours
ME 113	Thermodynamics I	3
Elective	In humanities or social studies (see page 137)	3
	Total	36

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for Elective (3).

Bachelor of Mechanical Engineering

		Semester Hours
JUNIOR YEAR		
CE 121	Rigid Body Mechanics II	3
CE 125	Engineering Materials	4
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics	3
ME 100	Analytical Kinematics	3
ME 113, 114	Thermodynamics I, II	6
ME 118	Heat Transfer	3
ME 120	Physical Metallurgy	3
Phys. 116	Quantum and Solid State Physics	3
Phys. 191	Nuclear Reactors	2
Elective	In humanities or social studies (see page 137)	3
	Total	36

		Semester Hours
SENIOR YEAR		
CE 157	Mechanics of Deformable Bodies	3
ME 123, 124	Advanced Dynamics I, II	6
ME 135-36	Thermal Power	6
ME 139	Fluid Machinery	3
ME 143	Production Analysis	3
ME 146	Dynamics of Compressible Fluids	3
ES 154	Automatic Control	4
Elective	In humanities or social studies (see page 137)	6
	Total	34

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for Elective (6).

Bachelor of Science in Engineering

		Semester Hours
JUNIOR AND SENIOR YEARS		
CE 121	Rigid Body Mechanics II	3
CE 125	Engineering Materials	4
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics	3
EE 103	Electric and Magnetic Fields	3
ME 100	Analytical Kinematics	3
ME 113	Thermodynamics I	3
ME 118	Heat Transfer	3
ME 120	Physical Metallurgy	3
Phys. 116	Quantum and Solid State Physics	3
	Total of required courses	31

	Semester Hours
Option	As approved by the Department of Option and by the Dean 30
Elective	In humanities or social studies (see below)..... 9
Total.....	70

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for Elective (3) and Option course (3).

The Bachelor of Science in Engineering curriculum provides training in the basic physical principles employed in engineering and in engineering methods of analysis, and in addition, offers an opportunity for study in an optional field in which the student has special interest.

Optional studies can be selected from one or (occasionally) more of the fields of Chemistry, Engineering Administration, Machine Computer, Mathematics, or Physics. The program of study in the option is formulated by the department concerned in conference with the student. The program, bearing the approval of the Executive Officer of the department concerned, must be submitted by the student to the Dean before the beginning of the junior year.

ELECTIVE IN HUMANITIES AND SOCIAL STUDIES

Required elective courses in the humanities and social studies may be selected from the offerings of the following departments of instruction: Art, Classical Languages and Literatures, English, Germanic Languages and Literatures, Philosophy, Religion, Romance Languages and Literatures, Slavic Languages and Literatures, Economics, Geography, History, Political Science, Sociology and Anthropology.

GRADUATE RECORD EXAMINATIONS

During the final semester of the senior year students in the School of Engineering are required to take the following Graduate Record Examinations: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and the Advanced Test (Engineering) designed to measure the achievement of the college senior in his major field of study. (For further information concerning the Graduate Record Examinations, see page 57.)

THE MASTER'S DEGREES

Upon satisfactory completion of appropriate graduate requirements, the degree of Master of Science in Engineering or Master of Engineering Administration is conferred.

Study for the Master's degree is based upon a faculty-student relationship in which the ability and needs of the individual student are important elements in determining the curriculum. Programs are not restricted to

one department or to a single field or type of study. They may include special instruction by assigned members of the engineering faculty or approved courses offered in other colleges and schools of the University. The Committee on Graduate Studies has the responsibility for establishing each student's program and for providing for its direction.

ADMISSION TO GRADUATE STUDY

For admission to graduate study the student must hold a Bachelor's degree from a recognized institution; satisfy the Committee on Graduate Studies of his capacity for productive work in the discipline; and give evidence of preparation which, in the opinion of the Committee, is adequate for graduate study in the field selected.

Applicants who have significant deficiencies in their preparation for graduate study may undertake prescribed undergraduate programs to qualify for admission as graduate students in the School of Engineering.

In some cases such undergraduate study may be carried on in addition to a limited graduate program. In no case may the undergraduate courses fulfill any part of the requirements for the graduate degree.

ADMISSION TO DEGREE CANDIDACY

Application for admission to candidacy for a Master's degree must be made in writing to the Committee on Graduate Studies. To be accepted the applicant must have (1) been accepted for graduate study, (2) satisfactorily completed 9 semester hours of graduate courses, and (3) give evidence of satisfactory personal and intellectual qualifications. In exceptional cases the requirement of 9 semester hours of graduate courses may be reduced.

ADVANCED STANDING

Graduate courses completed before admission to graduate study are not transferable for degree credit. The Committee on Graduate Studies has the discretion, however, to consider them in establishing individual programs. Course work to satisfy degree requirements in another school or college of the University may not be so applied in the School of Engineering.

REQUIREMENTS FOR THE DEGREES

Residence

The candidate for a Master's degree must complete a minimum of one year of full-time study, or the equivalent in part-time study, under the direction of the Committee on Graduate Studies. A full-time student must complete all requirements for the degree within three years; a part-time student, within five years.

Scholarship

A minimum grade of *S* (satisfactory) is required in all courses. A student who makes one grade of *U* (unsatisfactory) may repeat the course once, or he may appeal to the Committee on Graduate Studies for guidance. A student who receives two or more grades of *U* will not be permitted to enroll further in the School of Engineering until he demonstrates by examination, or as the Committee may direct, that his deficiencies in course work have been removed. A grade of *B* or better is required for undergraduate courses taken to remove deficiencies in preparation for graduate study.

Master's Thesis

The degree candidate must submit an acceptable thesis to demonstrate his ability to make independent use of the knowledge and discipline of thought acquired and developed by graduate study, and to furnish objective evidence of constructive power in a given field. Work of a suitable character for which the student has professional responsibility may be considered, whether done on or off campus, provided no significant amount of work is completed without faculty supervision.

Comprehensive Examination

To demonstrate substantial understanding of principles and methods of their use in the area of his interest, the student must pass a comprehensive examination, written, oral, or both, as prescribed by the Committee on Graduate Studies. This examination will not be taken until the candidate has successfully completed the prescribed program of study and submitted an acceptable Master's thesis.

THE DEGREE OF MASTER OF SCIENCE IN ENGINEERING

The objective of this discipline is a substantial comprehension of scientific principles and methods for their use, as applied in modern engineering. Increased understanding of engineering science and its use in solving engineering problems are sought, rather than a breadth of familiarity with applications and techniques.

A program of study consisting of at least 24 semester hours of graduate courses to prepare the candidate for his comprehensive examination is formulated from the following areas with particular attention to the individual student's needs and objectives. The program may provide for broad coverage in a variety of fields or may be designed to give some degree of specialization in a particular area, as determined by conference with the Committee at the time of admission to candidacy.

The level of the courses ordinarily requires as prerequisite the satisfactory completion of at least one undergraduate course in mathematics beyond the first course in ordinary differential equations and at least one in the area of the graduate course to be undertaken.

REQUIRED COURSES

Upon admission to graduate study, the following courses must be taken prior to application for admission to candidacy for the degree:

ES 211 Analysis of Engineering Systems I (3)

ES 217 Analytical Mechanics (3)

In addition a choice must be made of one or two courses in the areas marked by an asterisk in the Fundamental Engineering group below.

PROGRAM OF STUDY

After admission to candidacy for the degree, the balance of the program may be arranged in consultation with the Committee on Graduate Studies from the following:

Basic

Mathematics.—Theory of functions of a complex variable, mathematical statistics, mathematical probability, vectors, tensors, matrices.

Physics.—Classical field theory, quantum mechanics, solid state physics, nuclear physics.

Applied Mathematics.—Numerical and graphical analysis, advanced mathematics for engineers.

Fundamental Engineering

*Automatic Control
 *Elasticity
 Elastic Stability
 *Electric Networks
 *Electromagnetic Fields
 Electronics
 *Fluid Dynamics
 Gas Dynamics

Heat Transfer
 Modulation and Noise
 Nonlinear Mechanics
 Plates and Shells
 Plasticity
 *Structural Theory
 *Thermodynamics
 *Transients

Elective

This group consists of courses offered occasionally in such areas as digital computers, high-speed aerodynamics, jet propulsion, potential theory, structural analysis, and transistors. In addition, graduate courses in areas not included in the Basic group offered by the departments of Mathematics, Statistics, Physics, and Chemistry may be taken for degree credit with the approval of the Committee. In general, work in areas which are characterized by a scientific discipline may be accepted in satisfaction of course requirements for the degree of Master of Science in Engineering.

THE DEGREE OF MASTER OF ENGINEERING ADMINISTRATION

The objective of this discipline is to develop an understanding of the principles and a competence in the practices of administration as applied

to engineering and scientific activities. Knowledge and understanding are sought rather than mere familiarity with techniques.

A study program is prescribed for each candidate, in accordance with his preparation and objective, by the Committee on Graduate Studies or an assigned adviser. Programs are integrated sequences of courses.

The degree of Master of Engineering Administration is granted upon the successful completion of (1) 30 semester hours of graduate courses, including the written Master's thesis, and (2) the Comprehensive Examination.

PREREQUISITE TO ADMISSION TO GRADUATE STUDY

In addition to the requirements for admission to graduate study stated on page 138, the applicant must have an adequate knowledge of the principles of human relations, the fundamentals of accounting, and the fundamentals of statistics. This requirement can be met by the successful completion of the following undergraduate courses or an approved equivalent: Psychology 145 *Principles of Human Relations*, Accounting 115 *Survey of Accounting*, or Statistics 107 *Statistics for Engineers*.

PROGRAM OF STUDY

The content of the courses immediately following is considered essential knowledge for every candidate for the degree of Master of Engineering Administration. The candidate is required to complete all of the courses except those in which he (1) has successfully completed graduate study or (2) can demonstrate to the Committee on Graduate Studies an acceptable knowledge of the course field. The following Engineering Administration courses must be taken prior to admission to candidacy: 201 *Engineering Administration I*, 202 *Engineering Administration II*, and 271 *Operations Research*.

	Semester Hours
EA 201	
EA 202	
EA 271	
EA 299-300	
Engineering Administration I.....	3
Engineering Administration II.....	3
Operations Research	3
Master's Thesis	6

The following courses provide knowledge in certain special areas of significance in engineering administration. The candidate is required to select at least two; it is preferable that he elect three.

	Semester Hours
EA 206	
EA 251	
EA 252	
Stat. 262	
Human Relations in Administration.....	3
Management of Research and Development.....	3
Production and Maintenance Management.....	3
Managerial Statistics and Quality Control.....	3

Elective

Courses are to be elected to provide a total of 30 semester hours for the program.

	Semester Hours
EA 261	Economic Analysis in Engineering Planning..... 3
EA 263	Quantitative Techniques of Engineering Administra- tion 3
EA 272	Problems in Operations Research..... 3
EA 273-74	Techniques of Operations Research..... 6
EA 295	Applied Research in Engineering Administration (arr.)
EA 296	Research in Engineering Administration (arr.)
Acct. 215	Survey of Managerial Accounting..... 3
Acct. 293	Budget Preparation and Control..... 3
Bus. Adm. 250	Contract Administration 3
Pub. Adm. 213	Administration in Government..... 6
Stat. 271-72	Statistical Information Theory..... 3-6
Elective	(To be selected from Engineering or the sciences), as approved by the Committee on Graduate Studies.

THE DOCTORAL PROGRAM**INTRODUCTORY**

The School of Engineering offers a program of advanced study and research leading to the degree of Doctor of Science. This program is limited to recognized engineering fields in which a scientific discipline exists and for which the University has adequate resources.

The Doctoral discipline is designed to prepare the student for a career of creative scholarship by providing a broad background of knowledge and an understanding of research methods. It requires study of interrelated fields of learning as well as original research in the engineering field of central interest.

The discipline for the degree is divided into two stages. The first—made up of a study of interrelated fields of learning which support the general area of research concentration—culminates in the qualifying examination. The second—composed of research investigation of a particular subject in a special field and the presentation of such research findings in a written dissertation—culminates in the final examination.

Detailed information on the program is provided in a separate publication obtainable on request.

ADMISSION

The applicant must possess adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. The applicant must have capabilities and interests beyond the ability to assimilate organized materials in formal courses of instruction. Originality of mind combined with balanced judgment and accuracy in observation or experiment are necessary to the successful applicant.

Language Requirements

A reading knowledge is required of two foreign languages important in the student's field of interest. One language examination must be passed before admission to graduate study. The second must be passed before admission to the qualifying examination and within one year of the start of study for the qualifying examination.

Application for Admission

Well in advance of the opening of the semester for which the student seeks admission, he must have a personal interview with the Chairman of the Committee on Graduate Studies or the professor under whom he wishes to study, to discuss the field of study, the University's facilities for guidance in this field, the applicant's qualifications, and the possibilities of an effective doctoral program. If an application for admission is indicated, the student will be advised concerning the details of application procedure.

STUDY FOR THE QUALIFYING EXAMINATION

Upon admission to study for the qualifying examination the student's admission committee becomes his Consultative Committee, which prescribes and directs his studies. The Committee assigns to him a group of fields of learning deemed necessary to insure his breadth of knowledge, as well as to support research in his central field. Members of the Committee advise the student concerning the scope and content of these fields of study, which are generally more inclusive and intensive than courses of instruction announced in the University catalogue, and will guide him in preparation for his examination in them.

The purpose of the qualifying examination is to ascertain that the student's breadth of background and intellectual development are adequate to support doctoral research and investigation in his central field. The qualifying examination is both written and oral and usually extends over a period of six days. It is given by a special committee consisting of members of the student's Consultative Committee and other scholars. Upon favorable report of the examiners to the Committee on Graduate Studies the student is admitted to candidacy for the degree, to pursue his specialized study and research under the supervision of a designated member of the Faculty.

The examination is the sole test of the student's ability to qualify for admission as a candidate for the degree, and to enter the second stage of his doctoral discipline.

RESEARCH, THE DISSERTATION, AND THE FINAL EXAMINATION

The student admitted to candidacy for the degree requests as Master in Research the member of the Faculty under whom he wishes to pursue research and specialized study. The Faculty member may accept or

reject such request. The research is arranged by the Master and approved by the Committee on Graduate Studies. Throughout the remainder of the doctoral program, the candidate is responsible solely to his Master in his research and in the presentation of his dissertation.

A dissertation is required as evidence of ability to perform scholarly research and to interpret and present its results. Upon approval of the dissertation (see page 57) by the Master, the candidate is presented for his final examination. The summaries of accepted dissertations are printed in a numbered issue of the University BULLETIN. The successful candidate is required before receiving his degree to pay a fee to cover the expense of the printing of the summary of his dissertation.

The final examination is oral and is open to the public. The candidate must demonstrate a mastery of his special field of interest and of the materials and techniques used in the research. The committee of examiners includes members of the Committee on Graduate Studies competent in the research field or in closely related subjects and may also include qualified experts brought to the University especially to participate in the examination. If the candidate satisfies the examining committee concerning the high quality and originality of his contribution to knowledge as well as his mastery of the scholarship and research techniques of his field, the Committee on Graduate Studies recommends him for the degree of Doctor of Science.

RESIDENCE AND CONTINUOUS STUDY

All of the work for the degree must be done in residence (on the campus), except in certain circumstances when the student may be permitted to undertake a portion of the research problem in an approved off-campus facility. The student must maintain continuous registration in the School of Engineering, even when the Committee on Graduate Studies has granted a leave of absence. Failure to maintain registration in each semester of the academic year disrupts the residence status of the student, and he must reapply for admission to graduate study under whatever new conditions and regulation are set up by his consultative committee.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the qualifying examination or as a candidate engaged in doctoral research. The qualifying examination, however, must be completed within five years of the date of admission, and the entire degree program must be completed within seven years. After admission the student may apply for his qualifying examination whenever his consultative committee believes that he is prepared to take it; his research and specialized study may be undertaken with whatever concentration of time meets the approval of his research adviser. Normally a minimum of two years of full-time study and research is spent in meeting the requirement for the degree.

THE SCHOOL OF PHARMACY

THE FACULTY AND STAFF OF INSTRUCTION*

C. W. Bliven, *Dean*; R. M. Leonard, *Assistant Dean*

Professors C. W. Bliven, I. B. Hansen, R. D. Kennedy, G. M. Koehl, C. E. Leese, R. H. Moore, R. B. Stevens, C. R. Treadwell, R. C. Vincent;
Associate Professor R. M. Leonard; *Associate Professorial Lecturer* C. G. Frailey; *Assistant Professors* F. D. Cooper, Rudolph Hugh, C. J. Kokoski, S. M. Schwartz, J. W. Skinner; *Instructor* G. G. Koustenis

Special Lecturers W. S. Apple, G. F. Archambault, Karl Bambach, W. P. Briggs, D. L. Finucane, L. E. Kazin, F. C. McAleer, J. L. Powers, M. L. Yakowitz

COMMITTEES†

THE DEAN'S COUNCIL‡

I. B. Hansen, R. D. Kennedy, S. M. Schwartz

COMMITTEE ON SCHOLARSHIP

R. C. Vincent (*Chairman*), R. M. Leonard, G. G. Koustenis

COMMITTEE ON ADMISSION AND ADVANCED STANDING

R. M. Leonard (*Chairman*), S. M. Schwartz, C. J. Kokoski

ADVISORY COMMITTEE

I. A. Tennyson (*Chairman*), J. E. Allen, Howard Bradbury, W. P. Briggs, M. H. Bortnick, M. L. Elsberg, D. I. Estrin, F. R. Franzoni, R. D. Gibbs, M. G. Goldstein, A. J. Obert

* The President of the University, the Dean of Faculties, the Dean and Assistant Dean of the School, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, and Assistant Professors constitute the Faculty.

† This listing of the Faculty and Staff of Instruction is for the academic year 1959-60.

‡ The Dean and Assistant Dean of the School of Pharmacy are members ex officio of all committees.

§ Elected by the Faculty.

GENERAL INFORMATION

INTRODUCTORY

In 1867 the foundation for the National College of Pharmacy was laid by the Apothecaries' Association of the District of Columbia. The College was opened in 1872 and continued until 1906, when it became affiliated with The George Washington University.

The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. It is a member of the American Association of Colleges of Pharmacy.

Washington offers many opportunities for the student of pharmacy. The American Institute of Pharmacy, the headquarters of the American Pharmaceutical Association, is only a few blocks from the School of Pharmacy. The Institute also houses a pharmaceutical museum, a library, and research laboratories. Government agencies and laboratories whose activities are closely allied to pharmacy, and the government libraries, the facilities of which are open to the student, are readily accessible.

The Institute and the Federal Government bring to Washington leaders in the fields of pharmacy, many of whom present to senior students in the School of Pharmacy current professional information.

The objectives of the School of Pharmacy are (1) to train professionally competent pharmacists, primarily for retail practice, and to help them acquire specialized training, a general education, and an attitude of responsibility to their profession and to society; (2) to promote the health profession of pharmacy in general, and particularly within the community.

To achieve these objectives, the School has developed a systematic plan of instruction for the professional courses which, in the four-year curriculum, are integrated with the liberal arts program; in the five-year curriculum, the professional work is based on a two-year preprofessional program of basic science and liberal arts. It further encourages student participation in University, professional, and civic organizations and activities which increase professional competence, raise professional standards, and help develop social responsibility.

REGULATIONS

Students in the School of Pharmacy are subject to and are expected to familiarize themselves with the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES as stated on pages 13-30, and the University regulations stated on pages 52-59.

Students registered in the Junior College Pharmacy curriculum are subject to the regulations of the Junior College. However, in the professional courses of that curriculum, the attendance requirements of the School of Pharmacy prevail.

AMOUNT OF WORK

Normal work for any year is that outlined under the head of "Curriculum Requirements", below. A student who wishes to take more than the normal amount of work may do so only with the permission of the Committee on Scholarship, the members of which are guided in their decision by his scholastic record and the extent to which he is employed. A student on probation is limited in the number of semester hours he may carry.

The student is not encouraged to undertake outside employment while attempting a full course of study. A student who maintains a quality-point index of 2.00 or higher for all courses and a quality-point index of 2.50 or higher for pharmacy courses may be granted permission by the Dean to undertake outside employment. The amount of employment permitted is governed by the scholarship record of the student and the number of semester hours for which he is registered.

A student previously unemployed who accepts employment subsequent to registration or at any time during a semester is required to report that fact immediately to the Dean.

ATTENDANCE

Except by special permission of the instructor, credit will not be given for any pharmacy course if absences, including both lecture and laboratory, exceed in number for each semester the hours of credit for the semester. If a course has distinct divisions such as lectures, laboratories, or recitations, the absences apply pro rata to such divisions.

EXAMINATIONS BEFORE STATE BOARDS OF PHARMACY

To be eligible for examination before state boards of pharmacy, the applicant is required to present satisfactory evidence of graduation from a college of pharmacy. In addition, most states require that the applicant have one year of practical experience in a pharmacy. This experience may not be gained concurrently with the school year and, in some states, a portion of it must be obtained following graduation.

THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY

Upon the satisfactory completion of the requirements of the School of Pharmacy, the degree of Bachelor of Science in Pharmacy is conferred.

REQUIREMENTS FOR THE DEGREE

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 52 and 53.

In order to graduate, a student must have a general quality-point index

of at least 2.00. In addition, he must have a quality-point index of at least 2.50 in all pharmacy courses.

Probation.—A student must maintain a general (over-all) quality-point index of 2.00 and a pharmacy quality-point index of 2.50 or be placed on probation.

The following scholarship rules on general quality-point index are applied when a student has undertaken a multiple of 9 semester hours. The rules on pharmacy quality-point index are applied when a student has completed 12 pharmacy semester hours and thereafter are applied in multiples of 9 hours.

First Probation.—A student is placed on first probation when his general quality-point index is below 2.00 or his pharmacy quality-point index is below 2.50. (See also under suspension.)

Second Probation.—A student who has a general quality-point index below 2.00 or a pharmacy quality-point index below 2.50 after a multiple of 9 semester hours is placed on second probation. However, a student who has a general quality-point index between 1.50 and 2.00 will be considered by the Committee on Scholarship. A student who has a pharmacy quality-point index between 2.20 and 2.50 will be considered by the Committee. In each case, the Committee may retain him on probation or suspend him.

Suspension.—A student who has a general quality-point index below 1.50 or a pharmacy quality-point index below 2.20 will be suspended; however, a student who has a general quality-point index between 1.40 and 1.50 will be considered by the Committee on Scholarship. A student who has a pharmacy quality-point index between 2.00 and 2.20 will be considered by the Committee. In each case, the Committee may retain him on probation or suspend him.

A student who is subject to probation for the third time, whether successive or after an interval, will be suspended. In considering a student for suspension, the rules on probation shall apply to either the general or the pharmacy quality-point index with probations for each index independent of the other index.

A student suspended for poor scholarship may apply for readmission after an interval of a calendar year. He must then submit evidence to the Dean of the School of Pharmacy that during his absence from the University he has so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

CURRICULUM

For the year 1960-61, the School of Pharmacy will offer both the four- and a five-year course. Starting April 1960, students without previous college work will be enrolled in the five-year course. For the semester beginning September 1960, however, students who have completed at least

one year of college work may qualify for admission to the four-year course. Both the four- and the five-year curricula are given below.

Four-year Curriculum.—The Junior College Pharmacy curriculum, as given under the four-year curriculum (see page 71), comprises the first two years of the four-year pharmacy course. The curriculum is established by the faculties of the School of Pharmacy and the Junior College in accordance with professional needs and complies, in so far as possible, with the latter group regarding the general cultural studies.

The curriculum requirements include at least 141 semester hours. The following curriculum leads to the degree of Bachelor of Science in Pharmacy.

Freshman and Sophomore Years

Courses	Did. hrs.*	Lab. hrs.*	Sem. hrs.	Clock hrs.*
Courses in the Junior College (see page 71).....	880	656	73	1536

Junior Year: Fall Semester

Courses	Did. hrs.	Lab. hrs.	Sem. hrs.	Clock hrs.
Chemistry 21.....	32	96	4	128
Pharmacy 101.....	32	48	3	80
Pharmacy 105.....	32	....	2	32
Pharmacy 107.....	48	....	3	48
Physiology 115.....	48	....	3	48
Physiology 117.....	....	48	1	48
Total.....	192	192	16	384

Junior Year: Spring Semester

Courses	Did. hrs.	Lab. hrs.	Sem. hrs.	Clock hrs.
Bacteriology 112.....	48	96	4	144
Chemistry 22.....	32	96	4	128
Pharmacy 102.....	32	96	4	128
Pharmacy 106.....	32	....	2	32
Pharmacy 110.....	48	....	3	48
Total.....	192	288	17	480

* Exclusive of Physical Education.

Senior Year: Fall Semester

*Biochemistry 221.....	32	96	4	128
Pharmacy 103.....	32	96	4	128
Pharmacy 111.....	48	....	3	48
Pharmacy 165.....	48	....	3	48
Elective	48	....	3	48
Total.....	208	192	17	400

Senior Year: Spring Semester

Courses	Did. hrs.	Lab. hrs.	Sem. hrs.	Clock hrs.
Bacteriology 210.....	32	....	2	32
*Biochemistry 222.....	32	96	4	128
Pharmacy 166.....	32	64	3	96
Pharmacy 176.....	32	....	2	32
Pharmacy 178.....	64	....	4	64
Pharmacy 188.....	48	....	1	48
Pharmacy 190.....	16	....	1	16
Pharmacy 192.....	....	48	1	48
Total.....	256	208	18	464
Grand Total.....	1728	1536	141	3264

The Five-year Curriculum.—The Junior College Pharmacy curriculum, as given under the five-year curriculum (see pages 71-72), comprises the first two years of the five-year pharmacy course. The curriculum is established by the faculties of the School of Pharmacy and the Junior College in accordance with professional needs of the School of Pharmacy and the general cultural program of the latter group.

The curriculum requirements include at least 161 semester hours. The following curriculum leads to the degree of Bachelor of Science in Pharmacy.

* Students planning to do graduate work may request the substitution of other courses for Biochemistry 221-22 if this course will be included in the graduate curriculum.

First and Second (Pre-Pharmacy) Years

Courses	Did. hrs.*	Lab. hrs.*	Sem. hrs.	Clock hrs.*
Courses in the Junior College (see pages 71-72)...	800	464	64	1264

Third Year: Fall Semester

Courses	Did. hrs.	Lab. hrs.	Sem. hrs.	Clock hrs.
Chemistry 21.....	32	96	4	128
Pharmacy 121.....	48	48	4	96
Pharmacy 125.....	48	....	3	48
Physiology 115.....	48	....	3	48
Physiology 117.....	....	48	1	48
Total.....	176	192	15	368

Third Year: Spring Semester

Courses	Did. hrs.	Lab. hrs.	Sem. hrs.	Clock hrs.
Bacteriology 112.....	48	96	4	144
Chemistry 22.....	32	96	4	128
Pharmacy 122.....	32	96	4	128
Pharmacy 126.....	48	....	3	48
Total.....	160	288	15	448

Fourth Year: Fall Semester

Courses	Did. hrs.	Lab. hrs.	Sem. hrs.	Clock hrs.
Biochemistry 221.....	32	96	4	128
Pharmacy 101.....	32	48	3	80
Pharmacy 110.....	48	....	3	48
Pharmacy 127.....	32	48	3	80
Elective	48	....	3	48
Total.....	192	192	16	384

* Exclusive of Physical Education.

Fourth Year: Spring Semester

Bacteriology 210.....	32	....	2	32
Biochemistry 222.....	32	96	4	128
Pharmacy 111.....	48	....	3	48
Pharmacy 112.....	48	48	4	96
Pharmacy 164.....	48	....	3	48
Total.....	208	144	16	352

Fifth Year: Fall Semester

Pharmacy 102.....	32	96	4	128
Pharmacy 107.....	48	....	3	48
Pharmacy 109.....	10	6	1	16
Pharmacy 115.....	48	....	3	48
Pharmacy 165.....	48	....	3	48
Elective	48	....	3	48
Total.....	234	102	17	336

Fifth Year: Spring Semester

Pharmacy 103.....	32	96	4	128
Pharmacy 166.....	48	64	4	112
Pharmacy 176.....	48	....	3	48
Pharmacy 178.....	64	....	4	64
Pharmacy 188.....	48	....	1	48
Pharmacy 190.....	16	....	1	16
Pharmacy 192.....	....	48	1	48
Total.....	256	208	18	464
Grand Total.....	2026	1590	161	3616

THE DEGREE OF MASTER OF SCIENCE IN PHARMACY*

Upon the satisfactory completion of the graduate requirements of the School of Pharmacy, the degree of Master of Science in Pharmacy is conferred.

DEFINITION OF THE MASTER'S WORK

The study leading to the degree of Master of Science in Pharmacy is a comprehensive survey of one or more of the fields of knowledge em-

* Courses applicable to this degree are not offered in 1960-61.

braced by Pharmacy. It is a continuation of the work of the student's undergraduate major and involves a greater acquaintance with scholarly method.

The student must satisfy certain minimum requirements as to previous preparation, residence, ability to read an approved modern foreign (European) language, and courses taken; but these requirements, while essential, are regarded primarily as qualifying measures. The student's knowledge of his field, as demonstrated by his thesis and by the results of his Master's examination (together with such other examinations involving special skills or techniques as may be required), is the basis upon which the Master's degree is conferred. The foreign language requirement may be waived by faculty action in the instance of students whose field of study at the Master's level may not require such preparation.

REQUIREMENTS FOR THE DEGREE

RESIDENCE

An academic year of residence is required, i.e., completion of a minimum of 30 semester hours of work including the thesis, which is counted as the equivalent of 6 hours of course work. Summer work may be counted in residence, but in no case may the period of residence aggregate less than twenty-seven weeks. Not more than 12 hours (which must be approved in advance by the Dean of the School of Pharmacy) may be taken in another school or division of this University, and such work may not be counted toward both a degree in that school or division and the Master's degree in the School of Pharmacy.

AMOUNT OF WORK

A student whose previous preparation in his chosen field has been adequate may complete his requirements, including the thesis, by a minimum of 30 semester hours; others are required to do additional work. First-group courses may not be credited toward the Master's degree. Pharmacy courses numbered below 200 may be credited toward the Master's degree only when registration for graduate credit has been approved at the beginning of the course by the instructor and the Dean of the School of Pharmacy.

ADMISSION TO CANDIDACY

In addition to admission requirements stated on page 22 the applicant for admission to candidacy for the Master's degree must be approved by the appropriate representative of the Department of Pharmacy and by the Dean.

SCHOLARSHIP

A student whose scholarship is considered unsatisfactory may be suspended by the Dean upon recommendation of the staff member under whom the student is working.

THE THESIS

The thesis may be of a research, expository, critical, or creative type.

The main purpose of a Master's thesis is to demonstrate the student's ability to make independent use of the information and training acquired through his other disciplines, and to furnish objective evidence of his constructive powers in his chosen field. Registration for the thesis must be no later than the beginning of the final year of preparation, unless the professor in charge of the thesis permits registration at the beginning of the final semester. The choice of the thesis subject must be approved by the professor in charge of the student's field and recorded in the Office of the Registrar by the date announced in the University calendar. Registration for the thesis is ordinarily made on the basis of 3 semester hours for two successive semesters. In exceptional cases, and with the approval of the professor in charge of the thesis, the student may register for the entire 6 hours during a single semester. The thesis in its final form must have the approval of the professor in charge of the student's field and must be presented to the Dean by the student no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see page 57) are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period the student must register for it again, and pay tuition on the same basis as for a repeated course.

FINAL EXAMINATION

In addition to the course examinations, the candidate must pass a final examination on the thesis and its related fields. This examination may be either written or oral at the discretion of the Faculty.

If the thesis is submitted more than three years after the course requirements have been completed, a written examination covering the student's complete program of study will also be required.

THE SCHOOL OF EDUCATION

THE FACULTY AND STAFF OF INSTRUCTION*

J. H. Fox, *Dean*; B. S. Root, *Assistant Dean*

Professors G. L. Angel, R. H. Atwell, H. F. Bright, Elizabeth Burtner†, Mitchell Dreese, D. C. Faith, J. H. Fox, Thelma Hunt, B. H. Jarman‡, Frances Kirkpatrick, J. H. Krupa§, A. C. LaBue, H. B. Lawrence, C. E. Leese, G. E. McSpadden, W. H. Myers, C. W. Pettit, B. S. Root, K. M. Towne; *Professorial Lecturers* Kenneth Brown, D. D. Darland, John Holden, Clayton Hutchins, Robert Jacobs, H. O. Johnson, B. D. Joy, F. M. Lumsden, Anthony Marinaccio, M. K. Remmlein, J. P. Walsh; *Associate Professors* J. G. Allee, Jr., M. E. Coleman, V. J. DeAngelis, R. G. Hanken, M. H. Shott, C. G. Stratemeyer; *Associate Professorial Lecturers* G. G. Jenkins, J. C. Lang, E. C. Nowlin, R. R. Reed, L. C. Walker, H. M. Wilson; *Assistant Professors* R. E. Baker, G. E. Cheney, H. G. Detwiler, L. H. George, E. M. Johnson, W. A. McCauley, C. R. St. Cyr, W. A. Smith, L. M. Stallings; *Lecturers* Pat Abernethy, B. A. Crump, Edwina Deans, R. W. Eller, John Giancaspro, L. B. Hanigan, Z. M. Huse, E. M. Logan, C. O. McDaniels, E. F. Rhodes, J. W. Suber, W. D. Thompson, J. W. Tyler, Ward Whipple, H. E. Wilson; *Instructor* C. S. Vaughan

FIELD STUDIES

Director R. W. Eller, *Assistant Director* J. W. Charles

FIELD SERVICE COORDINATORS

Alexander Anderson, *Assistant Principal, Washington-Lee High School, Arlington, Va.*; M. F. Maré, *Assistant Principal, Dean of Girls, Wakefield High School, Arlington, Va.*; C. M. Richmond, *Principal, Stratford Junior High School, Arlington, Va.*

COMMITTEES||

THE DEAN'S COUNCIL¶

1961: H. G. Detwiler, Frances Kirkpatrick; 1962: R. E. Baker, W. A. McCauley; 1963: W. H. Myers, L. M. Stallings

* The President of the University, the Dean of Faculties, the Dean and Assistant Dean of the School, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, and Assistant Professors constitute the Faculty.

† This listing of the Faculty and Staff of Instruction is for the academic year 1959-60.

‡ On sabbatical leave spring semester 1959-60.

§ On leave of absence spring semester 1959-60.

|| On sabbatical leave fall semester 1959-60.

¶ The Dean and Assistant Dean of the School of Education are members ex officio of all committees.

¶ Elected by the Faculty.

COMMITTEE ON GRADUATE STUDIES

J. H. Fox (*Chairman*), G. L. Angel, Mitchell Dreese, D. C. Faith, Thelma Hunt, A. C. LaBue, W. A. McCauley, B. S. Root, C. R. St. Cyr

COMMITTEE ON ADMISSION AND ADVANCED STANDING

J. H. Fox (*Chairman*), Frances Kirkpatrick, J. H. Krupa, B. S. Root, L. M. Stallings, J. Y. Ruth

COMMITTEE ON SCHOLARSHIP

B. S. Root (*Chairman*), V. J. DeAngelis, H. B. Lawrence, K. M. Towne

GENERAL INFORMATION

INTRODUCTORY

It is the purpose of the School of Education to prepare teachers, counselors, and administrators for the higher ranges of educational service and to offer opportunities to teachers of experience to extend their education. The School includes the departments of Education, Physical Education, and Home Economics. It offers both graduate and undergraduate work. Other departments of the University provide general education and teaching field courses needed for a well-balanced program of teacher education.

The schedule of courses is arranged to meet the convenience of both full-time and part-time students. By attending evening, Saturday, and summer classes, teachers in the schools of the metropolitan Washington area and others within commuting range may complete all the requirements for a degree without giving up their positions.

REGULATIONS

Students in the School of Education are subject to, and are expected to familiarize themselves with, the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 13-30, and the University regulations stated on pages 52-59.

AMOUNT OF WORK

Fifteen to 17 semester hours of credit constitute a normal program. A student with a quality-point index of 3.00 or higher, may, with the permission of the Dean, enroll for 18 or 19 hours. No student may enroll for more than 19, except by permission of the Committee on Scholarship.

A student with extracurricular employment of 15 hours or less a week is permitted to carry a normal program of college work.

A student with extracurricular employment of from 16 to 25 hours a week may enroll for 12 or 13 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 15 or 16 hours.

A student with extracurricular employment of from 26 to 34 hours a week may enroll for 9 or 10 semester hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 12 or 13 hours.

A student with extracurricular employment of 35 hours or more a week may enroll for 6 or 7 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 9 or 10 hours.

A student who increases his hours of employment subsequent to registration or at any time during a semester is required to report that fact immediately to the Dean so that his program may be brought within the limitations outlined above.

THE BACHELOR'S DEGREES

Upon the satisfactory completion of the undergraduate requirements of the School of Education, the degree of Bachelor of Arts in Education, Bachelor of Science in Home Economics, or Bachelor of Science in Physical Education is conferred.

The program of work of each student must be approved by a Faculty adviser. Since each student's program of work will be defined by his particular needs, it is important that the student have a clear concept of his major interest in education, and also that he be familiar with the teaching-certificate requirements in the locality in which he expects to teach.

REQUIREMENTS FOR THE DEGREES

To be recommended for a degree a student must satisfy the admission, residence, scholarship, and curriculum requirements.

RESIDENCE

Candidates for the Bachelor's degrees must complete satisfactorily while matriculated in the School of Education a minimum of 30 semester hours, 9 of which, with the approval of the adviser, may be in the Off-Campus Division of the College of General Studies.

For full details concerning registration, see pages 56-57.

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 52 and 53.

In order to graduate, a student must have a quality-point index of at least 2.00.

Probation.—An undergraduate student who fails to maintain a quality-point index of at least 2.00 will be placed on probation. A student re-

mains on probation as long as his quality-point index is below 2.00, or until his probation is removed by the Committee on Scholarship.

Suspension.—An undergraduate student on probation who fails to raise his quality-point index to 2.00 within the time specified by the Committee on Scholarship may be suspended. An undergraduate student who fails to make passing grades in one-half or more of a minimum of 16 semester hours of course work may be suspended.

A student who has been suspended for poor scholarship may within ten days appeal his case to the Committee on Scholarship through the Dean. If the case appears to be remediable and the student appears likely to improve in his scholarship thereafter, the Committee may readmit him on probation. A student who has been denied readmission on probation may petition the Committee on Scholarship through the Dean for readmission after a lapse of a calendar year. A student who has been suspended twice will not be readmitted.

CURRICULUM REQUIREMENTS

In any of the following curricula at least 30 semester hours must consist of courses numbered above 100.

Bachelor of Arts in Education

Programs leading to the degree of Bachelor of Arts in Education have four main objectives: (1) provision of general educational backgrounds, (2) a functional command of ideas, concepts, knowledges, and skills in one or more teaching fields, (3) a mastery of basic professional information and skills adequate for a beginning teacher, and (4) development of attitudes needed for success in teaching. Since the contents of teaching fields differ in scope and complexity, some programs are longer than others in terms of semester hours. None require less than 126 hours of satisfactory work, exclusive of required Physical Education.

Normally, from 60 to 64 semester hours of the total requirement are completed in the Junior College of the University or in an equivalent institution elsewhere. (See "Education," page 72.)

The general educational backgrounds needed by prospective teachers are obtained through: (1) precollege education, (2) college courses, (3) work experience, (4) leadership activities, (5) participation in student campus activities, and (6) utilization of off-campus cultural opportunities.

Teaching-field requirements include satisfactory completion of prescribed academic courses in one or more fields, a satisfactory score on the special field examination of the National Teacher Examinations, and satisfactory completion of the prescribed special methods courses. Programs of study are available in the following fields: art, biology, business edu-

cation, chemistry, elementary education, English, French, general science, geography, German, history, home economics, mathematics, physical education, physics, Russian, social studies, Spanish, and speech.

Those preparing to teach on the secondary level may be required to complete the prescribed courses in a minor as well as a major field. Students preparing to teach on the elementary level are advised to use free electives to increase their mastery of content in an academic field or area of specialization.

Prescribed Courses in the Various Teaching Fields*

	ART	Semester Hours
Six semester hours from the following.....		6
Art 1: Art Appreciation		
Art 31-32: Survey of Art		
Art 71-72: Introduction to the Arts in America		
Art 101: Ancient Art		
Art 102: Medieval Art		
Art 109: Nineteenth Century Art in Europe		
Art 110: Contemporary Art		
Art 205: Baroque Art in Italy		
Six semester hours from the following.....		6
Art 105: Renaissance Art in Italy		
Art 106: Renaissance Art in the North		
Art 203: Primitive Art		
Art 204: Art of the Far East		
Art 210: Christian Iconography		
Twenty-four semester hours from the following.....		24
Art 21-22: Basic Design		
Art 45-46: Drawing and Painting I—Life and Still Life		
Art 65-66: Drawing and Painting I—Life, Still Life, and Portrait		
Art 67-68: Drawing and Painting I—Life and Portrait		
Art 81-82: Sculpture I		
Art 125-26: Drawing and Painting II—Life, Still Life, and Portrait		
Art 127-28: Drawing and Painting II—Life and Portrait		
Art 165-66: Drawing and Painting II—Life and Portrait		
Art 179-80: Sculpture II		
Art 183-84: Commercial Art		
Total.....		36
BIOLOGY		
Biology 1-2: Survey in Biology.....		6
Biology 127: Genetics		3
Botany: (Advanced courses as approved by the adviser).....		6
Chemistry 11-12: General Chemistry		8
Physiology: (As approved by the adviser).....		4
Physics 11, 12: Introductory Physics		6
Zoology 41-42: Comparative Vertebrate Anatomy.....		6
Zoology 101-2: Invertebrate Zoology		6
Total.....		45

* Not required for the minor.

BUSINESS EDUCATION		Semester Hours
Accounting 1: Introductory Accounting.....		3
Economics 1-2: Principles of Economics.....		6
Secretarial Studies 51: Business Correspondence.....		3
Additional courses, as prescribed, in one of the following groups:		
Group 1—Secretarial Studies*		
Secretarial Studies 2: Intermediate Typewriting.....		3
Secretarial Studies 12: Intermediate Shorthand and Transcription		3
Secretarial Studies 15: Advanced Shorthand, Typewriting, and		
Transcription		3
Secretarial Studies 16: Secretarial Shorthand, Typewriting, and		
Transcription		3
Secretarial Studies 54: Secretarial Practice.....		6
†Additional courses from the following, as approved by the adviser		
Accounting 2: Introductory Accounting		
Business Administration 101: Business Organization and Com-		
bination		
Business Administration 109: Office Management		
Business Administration 141: Principles of Marketing		
Business Administration 151: Retail Store Management		
Business Administration 161: Commercial Law: Contracts,		
Sales, Agency, and Bailments		
Economics 121: Money and Banking		
Statistics 52: Mathematics of Finance		
Total.....		33
Group 2—Bookkeeping, Business Arithmetic, and Business Law		
Accounting 2: Introductory Accounting.....		3
Business Administration 101: Business Organization and Combina-		
tion		3
Business Administration 102: Fundamentals of Management.....		3
Business Administration 161: Commercial Law: Contracts, Sales,		
Agency, and Bailments.....		3
Business Administration 162: Commercial Law: Negotiable Instru-		
ments, Property, Mortgages		3
Statistics 52: Mathematics of Finance.....		6
†Six semester hours from the following, as approved by the adviser...		
Accounting 111: Financial Statement Analysis		
Business Administration 121: General Insurance		
Business Administration 131: Business Finance		
Business Administration 138: Investments		
Economics 121: Money and Banking		
Total.....		36
Group 3—Distributive Education		
Business Administration 141: Principles of Marketing.....		3
Business Administration 142: Marketing Management Problems...		3
Business Administration 145: Sales Management.....		3
Business Administration 151: Retail Store Management.....		3

* Candidates inadequately prepared for Secretarial Studies 2 or 12 may be required to take Secretarial Studies 1 or 11.

† Not required for the minor.

Semester
Hours

*Twelve semester hours from the following, as approved by the adviser 12

Business Administration 147:	Advertising	
Business Administration 150:	Procurement and Materials Management	
Business Administration 158:	Traffic Management	
Business Administration 175:	Introduction to Foreign Trade	
Business Administration 176:	Exporting and Importing	
Total.....		36

CHEMISTRY

Chemistry 11-12:	General Chemistry	8
Chemistry 21:	Qualitative Inorganic Analysis.....	4
Chemistry 22:	Quantitative Inorganic Analysis I.....	4
Chemistry 151-52:	Organic Chemistry.....	8
Chemistry 191:	History of Chemistry	2
Mathematics 3:	College Algebra	3
Mathematics 6:	Plane Trigonometry	3
Mathematics 12:	Analytic Geometry	3
Physics 11, 12, 13:	Introductory Physics.....	9
Total.....		44

ELEMENTARY EDUCATION

Education 113:	Elementary School Art.....	3
Education 114:	Elementary School Music.....	3
Geography 51, 52:	Introduction to Geography; World Regions.....	6
History 71-72:	Development of the Civilization of the United States..	6
Mathematics 2:	General Mathematics.....	3
Physical Education 101:	Physical Education in Elementary School....	3
Science, as approved by adviser.....		6-8
Six semester hours from the following, as approved by the adviser....		6
Economics 1-2:	Principles of Economics	
History 39-40:	Development of European Civilization	
Political Science 9-10:	Government of the United States	
Religion 59-60:	History of Religion	
Sociology and Anthropology 1-2:	Man in Modern Society	
Total.....		36-38

Prospective elementary school teachers are urged to select an area of specialization from one of the following subject-matter fields: French, Spanish, Russian, Physical Education. For detailed requirements, see the School of Education separate catalogue.

ENGLISH

English 1, 2:	English Composition.....	6
English 52:	Introduction to English Literature.....	3
English 71-72:	Introduction to American Literature.....	6
English 125:	Introduction to English Linguistics.....	3
English 135-36:	Shakespeare.....	6
Speech 11:	Voice and Diction.....	3
*Nine semester hours from the following, as approved by the adviser...		9
English 151-52:	The Romantic Movement	

* Not required for the minor.

English 161-62:	Victorian Literature	
English 165-66:	The Twentieth Century	
English 171-72:	Studies in American Literature	
English 173-74:	Major American Poets	
English 176:	American Drama	
English 177-78:	American Fiction	
English 182:	The English Novel	
English 199:	Proseminar	

Total..... 36

FRENCH

French 1-2:	First-year French	6
French 3-4:	Second-year French	6
French 9-10:	French Conversation and Composition	6
French 51-52:	Survey of French Literature and Civilization	12
*Additional courses in French, as approved by the adviser		

Total..... 36

GENERAL SCIENCE†

Chemistry 11-12:	General Chemistry	8
Chemistry 21:	Qualitative Inorganic Analysis	4
Physics 11, 12, 13:	Introductory Physics	9
Physics 16:	General Physics	3
Nine semester hours from the following		9
Mathematics 3:	College Algebra	
Mathematics 6:	Plane Trigonometry	
Mathematics 12:	Analytic Geometry	
Mathematics 29, 30, 31:	Calculus I, II, III	6-8
One of the following		
Biology 1-2:	Survey in Biology	
Botany 1-2:	General Botany	
Zoology 1-2:	Introduction to Zoology	

Total..... 39-41

GEOGRAPHY

Geography 51:	Introduction to Geography	3
Geography 52:	World Regions	3
Geography 103-4:	Cartography	6
Geography 115-16:	Physical Geography	6
Geography 141-42:	Urban Settlement	6
*Six semester hours from the following		
Geography 183:	Western Europe	
Geography 184:	The Mediterranean	
Geography 191:	Latin America	
Geography 195:	Eastern and Southeastern Asia	
Geography 197:	The Pacific	
Geography 198:	Australia	

* Not required for the minor.

† May not be chosen as a minor field.

Semester
Hours

*Six semester hours from the following.....	6
Geography 125: Transportation Complexes	
Geography 126: World Food Supply	
Geography 133: Regional Industrial Structures	
Geography 134: Location of Industry	
Geography 145: World Cultural Geography	
Geography 146: World Political Geography	

Total.....	36
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GERMAN

German 1-2: First-year German.....	6
German 3-4: Second-year German.....	6
German 9-10: German Conversation and Composition.....	6
German 51-52: Introduction to German Literature.....	6
*Additional courses in German, as approved by the adviser.....	12

Total.....	36
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HISTORY

History 39-40: The Development of European Civilization.....	6
History 71-72: The Development of the Civilization of the United States.....	6
Six semester hours from each of the following groups, as approved by the adviser.....	18

Group 1—American History

History 171-72: Social History of the United States	
History 173: Representative Americans	
History 174: Economic History of the United States	
History 181-82: Diplomatic History of the United States	

Group 2—European History

History 109: Intellectual History of the Western World I: the Classical World	
History 110: Intellectual History of the Western World II: the Middle Ages and Renaissance	
History 130: Nationalism	
History 143-44: History of Old Russia	
History 147: Economic History of Europe	
History 149-50: European Diplomatic History	
History 151-52: English History	

*Group 3—Latin American History

History 163: Colonial Latin America	
History 164: South America since Independence	
History 166: Mexico and the Caribbean since Independence	
Political Science 178: Recent Trends in Latin American Politics and Government	
Political Science 178: International Politics in the Western Hemisphere	

*Additional semester hours from one of the foregoing groups, as approved by the adviser.....	6
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Total.....	36
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* Not required for the minor.

HOME ECONOMICS		Semester Hours
Home Economics 1:	Food Selection and Preparation.....	3
Home Economics 22:	Clothing: Its Selection, Cost, and Care.....	3
Home Economics 51:	Family Meals.....	3
Home Economics 53:	Family Health and Household Sanitation.....	3
Home Economics 62:	Clothing Construction.....	3
Home Economics 102:	Advanced Food Preparation.....	3
Home Economics 123:	Household Finance and Problems of the Con- sumer	3
Home Economics 143:	Advanced Clothing Construction.....	3
Home Economics 152:	Nutrition	3
Home Economics 171:	House Furnishing	3
Home Economics 181:	The Child in the Home.....	3
Home Economics 192:	The Home, Its Management and Equipment..	3
Physiology 115:	Physiology	3
Total.....		39

MATHEMATICS		
Mathematics 3:	College Algebra.....	3
Mathematics 6:	Plane Trigonometry.....	3
Mathematics 12:	Analytic Geometry.....	9
Mathematics 29, 30, 31:	Calculus I, II, III.....	
*Mathematics 102:	Fundamental Concepts of Mathematics (or an alternative approved by the adviser).....	3
*Mathematics 123:	Theory of Equations, or	3
*Mathematics 125:	Advanced Algebra.....	
*Mathematics 132:	Differential Equations, or	3
*Mathematics 139:	Advanced Calculus I.....	3
*An additional course in Mathematics, as approved by the adviser....		30
Total.....		

PHYSICAL EDUCATION

For detailed requirements for the minor teaching field for secondary school majors see the School of Education separate catalogue.

PHYSICS		
Physics 11:	Introductory Physics.....	3
Physics 14, 15, and 16:	General Physics.....	9
Physics 55:	Physical Measurements.....	3
Physics 101:	Mechanics	3
Physics 105:	Principles of Electricity.....	3
Physics 106:	Optics	
*Chemistry Elective—Chemistry 11–12:	General Chemistry or	
Chemistry 12 and 21:	General Chemistry and Qualitative Inorganic Analysis	8
Mathematics 12:	Analytic Geometry.....	3
Mathematics 29, 30, 31:	Calculus I, II, III.....	9
*Six semester hours from the following.....		6
Physics 102: Heat and Thermodynamics		

* Not required for the minor.

Semester
Hours

Physics 113:	Atomic Physics	
Physics 114:	Statistical Physics	
Physics 128:	Sound	
Physics 132:	Electronics	
Physics 155:	Advanced Laboratory in Electricity and Magnetism	
Physics 156:	Advanced Laboratory in Optics	

Total.....	50
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RUSSIAN *

Russian 1-2:	First-year Russian.....	6
Russian 3-4:	Second-year Russian.....	6
Russian 9-10:	Russian Conversation.....	6
Russian 101-2:	Rapid Readings in Russian.....	6

Total.....	24
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SOCIAL STUDIES

History 39-40:	The Development of European Civilization.....	6
History 71-72:	The Development of the Civilization of the United States.....	6
Political Science 9-10:	Government of the United States.....	6
Twelve semester hours from the following.....		12

Economics 1-2:	Principles of Economics	
Geography 51, 52:	Introduction to Geography; World Regions	
Religion 59-60:	History of Religion	
Sociology and Anthropology 1-2:	Man in Modern Society	
†Additional second-group courses, as approved by the adviser, from one of the following fields: Economics, Geography, History, Political Science, Religion, Sociology and Anthropology.....		12

Total.....	42
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SPANISH

Spanish 1-2:	First-year Spanish.....	6
Spanish 3-4:	Second-year Spanish.....	6
Spanish 9-10:	Spanish Conversation and Composition.....	6
†Additional courses, as approved by the adviser.....		18

Total.....	36
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SPEECH

Speech 1:	Effective Speaking.....	3
Speech 2:	Persuasive Speaking.....	3
Speech 11:	Voice and Diction.....	3
Speech 32:	Oral Reading.....	3
Speech 101:	Voice and Phonetics.....	3
Speech 121:	Group Discussion and Conference Leadership.....	3
Speech 153:	Acting.....	3
Speech 175:	Speech Correction.....	3

* May be chosen as a minor field only.
† Not required for the minor.

	Semester Hours
One of the following areas of specialization, as approved by the adviser:	
*Group 1—Speech Arts	
Twelve semester hours from the following.....	12
Speech 102: Oral Interpretation of Literature	
Speech 126: Public Discussion and Debate	
Speech 154: Play Production	
Speech 166: History of the Theater	
Speech 169: Creative Dramatics and Children's Theater	
*Group 2—Speech Correction	
Twelve semester hours from the following.....	12
Speech 176: Speech Correction	
Speech 177-78: Clinical Practice in Speech Therapy	
Speech 182: Hearing Problems and the Testing of Hearing	
Speech 183-84: Clinical Practice in Hearing Therapy	
Speech 191: Proseminar: Speech Correction	
Additional courses in English, Physiology, Psychology, or Speech, as approved by the adviser	
Total.....	36

Professional Education

The basic professional information, skills, and attitudes needed by beginning teachers are provided through a sequence of courses to be taken in the junior and senior years. Lectures and class discussions are closely coordinated with field work. Instruction is differentiated to meet the needs of those preparing to teach on the various levels—elementary school, junior high school, senior high school, and adult.

PROFESSIONAL COURSES—SECONDARY		
Education 109-10: Human Development, Learning, and Teaching...		6
Education 121-22: Society and the School.....		3
Education 131: Common Teaching Skills in Secondary Schools...		6-9
Education 133-34: Observation and Student Teaching in Secondary Schools		3-6
Three to six semester hours from the following Special Methods courses		
Education 136: Teaching English		
Education 138: Teaching Social Studies		
Education 140: Teaching Mathematics		
Education 144: Teaching Science		
Education 146: Teaching Foreign Languages		
Education 148: Teaching Home Economics		
Education 150: Teaching Business Subjects		
Total.....		24-30

PROFESSIONAL COURSES—ELEMENTARY		
Education 109-10: Human Development, Learning, and Teaching...		6
Education 111: Methods in Elementary Education.....		6-12

* Not required for the minor.

		Semester Hours
Education 112:	Guidance in Elementary Schools.....	3
Education 121-22:	Society and the School.....	6
Education 135:	Student Teaching in Elementary Schools.....	9
Total.....		36

Bachelor of Science in Home Economics

The curriculum leading to this degree is designed to prepare young women for the important responsibility of home-making. The program can be adapted, however, to meet special requirements in nutrition, dietetics, clothing, and other related fields. Each student must plan her work with the assistance of a faculty adviser in the Department of Home Economics.

GENERAL HOME-MAKING

JUNIOR YEAR	Semester Hours	SENIOR YEAR	Semester Hours
Home Economics 53.....	3	Home Economics 152.....	3
Home Economics 72.....	3	Home Economics 171.....	3
Home Economics 102.....	3	Home Economics 181.....	3
Home Economics 123.....	3	Home Economics 192.....	3
Physiology 115.....	3	Home Economics 197-98.....	6
Elective	15	Elective	12
Total.....	30	Total.....	30

Bachelor of Science in Physical Education for Men

There are three curricula leading to this degree*. The Single-Major and Subject-Certification Teacher's Curriculum is designed to prepare students for teaching positions in smaller schools where it is necessary to teach an academic subject in addition to physical education. The Single-Major Teacher's Curriculum prepares for the teaching of physical education in the larger schools. The Physical Education and Recreation Curriculum has been planned for those who wish to be prepared to direct programs of recreation in addition to the teaching of physical education.

The minimum requirements for this degree are 66 semester hours, distributed as follows:

SINGLE-MAJOR AND SUBJECT-CERTIFICATION TEACHER'S CURRICULUM

The minimum requirements for this degree are 21 semester hours in education, 24 hours in physical education, 18 hours in an academic teaching field, and 3 hours in physiology, distributed as follows:

* Candidates for the degree of Bachelor of Arts in Education may also prepare to teach Physical Education in secondary schools as a minor teaching field. Those preparing in the elementary school may choose Physical Education as an area of specialization. For detailed requirements see School of Education separate catalogue.

JUNIOR YEAR		Semester Hours	SENIOR YEAR		Semester Hours
Education 109-10.....		6	Education 131.....		3
Education 121-22.....		6	Education 133-34.....		6
Physical Education 103.....		3	Physical Education 115-16.....		4
Physical Education 105.....		3	Physical Education 122.....		3
Physical Education 107.....		1	Physical Education 131.....		3
Physical Education 113-14.....		4	Physical Education 138.....		3
Physiology 115.....		3	Academic teaching field.....		11
Academic teaching field.....		7			
Total.....		33	Total.....		33

SINGLE-MAJOR TEACHER'S CURRICULUM

The minimum requirements for this degree are 21 semester hours in education, 28 hours in physical education, 3 hours in physiology, and 14 hours of electives:

JUNIOR YEAR		Semester Hours	SENIOR YEAR		Semester Hours
Education 109-10.....		6	Education 131.....		3
Education 121-22.....		6	Education 133-34.....		6
Physical Education 103.....		3	Physical Education 105.....		3
Physical Education 107.....		1	Physical Education 122.....		3
Physical Education 109-10.....		4	Physical Education 131.....		3
Physical Education 113-14.....		4	Physical Education 138.....		3
Physical Education 115-16.....		4	Elective		12
Physiology 115.....		3			
Elective		2	Total.....		33
Total.....		33			

PHYSICAL EDUCATION AND RECREATION CURRICULUM

The minimum requirements for this curriculum are 66 semester hours, distributed as follows:

JUNIOR YEAR		Semester Hours	SENIOR YEAR		Semester Hours
Education 109.....		3	Education 131.....		3
Education 121-22.....		6	Education 133-34.....		6
Physical Education 48.....		2	Physical Education 103.....		3
Physical Education 107.....		1	Physical Education 122.....		3
Physical Education 109-10.....		4	Physical Education 131.....		3
Physical Education 113-14.....		4	Physical Education 138.....		3
Physical Education 132.....		1	Physical Education 161.....		3
Physical Education 151-52.....		6	Physical Education 162.....		6
Elective		6	Elective		3
Total.....		33	Total.....		33

Bachelor of Science in Physical Education for Women

There are three curricula leading to this degree*. The Single-Major

* Candidates for the degree of Bachelor of Arts in Education may also prepare to teach Physical Education in secondary schools as a minor teaching field. Those preparing in the elementary school may choose Physical Education as an area of specialization. For detailed requirements see School of Education separate catalogue.

and Subject Certification Teacher's Curriculum is designed to prepare students for teaching positions in smaller schools where it is necessary to teach an academic subject in addition to physical education. The Single-Major Teacher's Curriculum prepares for the teaching of physical education in the larger schools. Within this curriculum there is opportunity for specialization in dance, sports, or correctives. The Physical Education and Recreation Curriculum has been planned for those who wish to be prepared to direct programs of recreation in addition to teaching physical education.

The minimum requirements for this degree are 66 semester hours distributed as follows:

SINGLE-MAJOR AND SUBJECT-CERTIFICATION TEACHER'S CURRICULUM

The student wishing to prepare herself to teach another subject in addition to Physical Education for Women may do so by choosing her elective hours from one subject-matter field with the advice of the Dean of the School of Education. Relevant work completed in the Junior College may be counted in this subject-matter field.

JUNIOR YEAR	Semester Hours	SENIOR YEAR	Semester Hours
Education 109-10.....	6	Education 121-22.....	6
Physical Education 101.....	3	Education 133-34.....	6
Physical Education 103.....	3	Physical Education 113-14.....	4
Physical Education 105-6.....	6	Physical Education 122.....	3
Physical Education 107.....	1	Physical Education 131.....	3
Physical Education 111-12.....	4	Physical Education 138.....	3
Physical Education 117.....	1	Elective or subject-matter field...	9
Physical Education 118.....	1		
Physical Education 132.....	1	Total.....	34
Physiology 115.....	3		
Elective or subject-matter field...	3		
Total.....	32		

PHYSICAL EDUCATION AND RECREATION CURRICULUM

JUNIOR YEAR	Semester Hours	SENIOR YEAR	Semester Hours
Physical Education 48.....	2	Education 121-22.....	6
Physical Education 101.....	3	Education 133-34.....	6
Physical Education 105-6.....	6	Physical Education 103.....	3
Physical Education 109-10.....	4	Physical Education 107.....	1
Physical Education 111-12.....	4	Physical Education 113-14.....	4
Physical Education 117.....	1	Physical Education 122.....	3
Physical Education 118.....	1	Physical Education 132.....	1
Physical Education 151-52.....	6	Physical Education 138.....	3
Physiology 115.....	3	Physical Education 161.....	3
Elective.....	3	Physical Education 162.....	3
Total.....	33	Total.....	33

THE DEGREE OF MASTER OF ARTS IN EDUCATION

Upon the satisfactory completion of the graduate requirements of the School of Education, the degree of Master of Arts in Education is conferred. This is a professional degree, designed to prepare the student for some particular type of educational service. The program of studies leading to the degree is selected by the candidate and his adviser from the various related departments of the University to give the student an adequate background in his chosen vocational field. For the prospective high school or junior high school teacher this will ordinarily include study in the subject which he is planning to teach as well as in the field of education.

In accordance with the foregoing general pattern of work, graduate programs of study are available in the following fields: (1) school administration—secondary school principalship or elementary school principalship; (2) adult education; (3) secondary education—senior or junior high school; (4) elementary education; (5) comparative education; (6) curriculum; (7) employee training; (8) guidance; (9) history of education; (10) philosophy of education; (11) reading; (12) teacher education. Programs of work for teachers-in-service are differentiated from those for students without teaching experience. Additional information concerning these programs may be obtained by writing to the Dean.

ADMISSION TO CANDIDACY

The requirements for admission to candidacy for the Master's degree are stated on page 22. Those wishing to prepare for careers in guidance or administration must have had at least two years of successful teaching experience. Candidates who have had no professional courses must satisfactorily complete the required undergraduate professional courses, including Student Teaching, in addition to graduate course requirements.

ADVANCED STANDING

Graduate work completed in other accredited institutions of learning may be credited toward the Master's degree, but a minimum of 30 semester hours must be completed at The George Washington University as a matriculated candidate for the degree in the School of Education.

Advanced courses completed in this University in excess of the requirements for the Bachelor's degree may be credited toward the Master's degree to the extent of 12 semester hours, provided the work fits in with the student's plan of specialization and is approved in writing by the Dean before being undertaken.

In determining advanced standing at the time of admission or readmission to Master's candidacy at this University, graduate work completed more than three years previously is not counted.

REQUIREMENTS FOR THE DEGREE

PLANS OF STUDY

Two plans of study lead to the degree of Master of Arts. *Plan 1* requires a minimum of 30 hours of graduate credit, including a thesis carrying 6 hours of graduate credit. *Plan 2* requires a minimum of 33 hours of graduate credit, including the course in *Educational Research Methods and Procedures* carrying 3 hours of graduate credit.

SELECTION OF COURSES

Programs of study under *Plan 1* must include a minimum of 12 semester hours from third-group courses in addition to the thesis. Under *Plan 2* a minimum of 18 hours, in addition to the course in *Educational Research Methods and Procedures*, must be from third-group courses.

Programs of study must include a minimum of 12 hours selected from courses offered in the Department of Education.

When programs of study include additional academic preparation in one or more teaching fields, undergraduate and graduate courses combined must be at least equivalent to the undergraduate requirements of the Bachelor of Arts degree in the teaching field concerned.

RESIDENCE

Candidates for the degree of Master of Arts in Education must complete satisfactorily at this University, as a matriculated candidate in the School of Education, a minimum of 30 semester hours, 9 of which, with the approval of the adviser, may be in the Off-Campus Division of the College of General Studies.

THE THESIS

The thesis required under *Plan 1*, must conform to standards prescribed. A statement of these standards may be obtained at the Office of the Dean.

The thesis subject must be approved in writing by the candidate's adviser and recorded in the Office of the Registrar by the date announced in the University calendar. The thesis in its final form must be presented to the Dean by the candidate no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see page 57) are available in the Office of the Dean.

Payment of tuition for the thesis will entitle the candidate, during the academic year of registration, to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be regis-

tered in residence during this period. If the preparation of the thesis extends beyond the two-year period it must be registered for again and tuition paid on the same basis as for a repeated course.

COMPREHENSIVE EXAMINATION

In addition to the course examinations, the candidate must pass a professional comprehensive examination in two parts: (1) a general examination concerned with an integrated understanding of the major areas in professional education, and (2) a special examination concerned with the candidate's area of specialization.

The general part of the comprehensive examination is divided into three groups as follows: Group I (Foundations) covers learning and teaching, society and the school, child and adolescent growth and development, history of education, philosophy of education, and educational research; Group II (Major Levels) covers elementary education, secondary education, adult education, employee training, and physical education; Group III (Common Elements) covers administration, curriculum, evaluation, guidance, methodology, and reading.

The candidate must be prepared to answer six questions, including at least one and not more than three questions in each group, none of which shall be concerned with his area of specialization.

FIVE-YEAR PROGRAM

A candidate entering the School of Education from the Junior College (or with equivalent preparation) may choose a three-year program leading to the degrees of Bachelor of Arts and Master of Arts in Education to be conferred simultaneously. The first year of this combined program will be devoted to teaching-field preparation; the work of the second year will include the Bachelor of Arts junior-year professional courses and a maximum of 18 semester hours of graduate courses; that of the third and final year, senior-year undergraduate professional courses and the remaining graduate courses needed for the Master's degree. Student Teaching, including observation of teaching, to be elected in the third year may not be taken for graduate credit. A quality-point index of at least 2.50 in undergraduate courses must be attained before beginning the work of the senior year and the program must meet all the requirements for the degrees of Bachelor of Arts and Master of Arts in Education.

THE ADVANCED PROFESSIONAL CERTIFICATE

Upon the satisfactory completion of the program of advanced graduate studies of the School of Education, the Advanced Professional Certificate is granted. This program is designed to prepare teachers and administrators for more effective service in their chosen fields and to enable them to qualify for a higher step in the local salary scale.

The program of studies leading to the Certificate is selected by the candidate and his adviser from the various related departments of the University in accordance with the student's needs. In general it includes 30 hours of graduate credit beyond the Master's degree. The candidate wishing to increase his teaching proficiency may include additional study in his teaching field. For information concerning available programs, see the separate catalogue of the School of Education.

ADMISSION TO CANDIDACY

The requirements for admission to candidacy for the Advanced Professional Certificate are state on pages 22-23. The applicant who is unable to meet the admission requirements may be admitted with deficiencies to be met by satisfactorily completing prerequisites in addition to the specified program of graduate study. Each applicant must be interviewed by a member of the Faculty of the School of Education.

TRANSFER OF CREDIT

Appropriate graduate work completed in other accredited higher institutions may be credited toward the requirements for the Certificate, but a minimum of 18 semester hours must be completed at The George Washington University as a matriculated candidate in the School of Education. The candidate is encouraged to include in his program study at other accredited higher institutions when such study seems to be in his best interest. In determining advanced standing at the time of admission or readmission to Certificate candidacy, graduate work completed more than three years previously is not counted.

REQUIREMENTS FOR THE CERTIFICATE

Plans of Study

In planning his program of studies the candidate should give first consideration to his particular needs. If he is a teacher and his graduate study leading to the Master's degree was largely in professional education, he may find it desirable to emphasize additional mastery of his teaching field. If his Master's preparation was in a content field, he may wish to devote a major part of his program to additional professional study. Those in administration and related services may wish to continue specialization on a more advanced level.

The program of study must include, in addition to any prerequisites, a minimum of 30 hours of graduate credit; 24 hours of which must be in third-group courses (or the equivalent at other institutions). Not more than 6 semester hours of graduate credit in second-group courses may be included in the minimum program and not less than 12 semester hours must be in courses offered by the School of Education.

RESIDENCE

Candidates for the Advanced Professional Certificate must complete satisfactorily at this University a minimum of 18 semester hours in courses offered on the campus. The balance of the program may be in the Off-Campus Division of the College of General Studies or in other approved institutions of higher learning. The candidate is not required to pursue his program of study continuously. On request, a leave of absence is granted to the candidate for a period not to exceed three years.

THE DEGREE OF DOCTOR OF EDUCATION

The requirements for the degree of Doctor of Education cannot be stated in semester hours, but they consist in general of at least two full years of work beyond the degree of Master of Arts in Education or the equivalent. The programs of study are designed to prepare students for administrative or supervisory positions, the teaching of education in schools, colleges, or departments of education, the teaching of an academic subject in schools or colleges, or for specialized types of educational service. The work is given a practical rather than a theoretical bent, and emphasizes the mastery and application of subject matter, both in the study requirements and in the dissertation. Special emphasis is placed upon the professional success of the candidate.

The candidate's program of study depends for the most part upon his previous educational background and his professional objective. Opportunities are provided for study leading to the following professional objectives: school superintendent, secondary school principal, elementary school principal, supervisor, director of guidance, director of curriculum development, professor of education, and specialist in educational research.

QUALIFICATIONS OF THE APPLICANT

The candidate for the degree of Doctor of Education must have completed (1) graduate work in fields prerequisite to his objective, equivalent to that required for the degree of Master of Arts in Education in The George Washington University, and (2) at least three years of successful educational experience pertinent to his professional objective.

ADMISSION TO CANDIDACY

To be admitted to candidacy for the degree the applicant must be accepted by the Committee on Graduate Studies on the basis of the following factors: (1) his previous scholastic record, (2) his professional success, (3) the outcomes of a series of personal conferences with staff members, (4) a scholastic-aptitude test, (5) an essay-type examination, and (6) an oral examination.

CONSULTATIVE COMMITTEE

If the applicant is accepted as a candidate, the Committee on Graduate Studies and his major adviser in cooperation with the candidate, will (1) determine the fields of study, in each of which the candidate must pass a written examination at least eight months before he presents himself for the degree; (2) formulate a list of courses and of readings that will assist him in preparing for these examinations; and (3) designate the tools of investigation that will be needed by the candidate in the prosecution of his study. These tools may include one foreign language or more, statistical methods, historical criticism, or any others considered essential by the committee. An examination in the tools designated must be passed by the candidate before he takes his final comprehensive examination.

THE DISSERTATION

When the candidate has satisfied the requirements of his program of studies, his progress will be reported by his major adviser to the Committee on Graduate Studies. If such progress is approved a member of the Faculty, in whose field the topic of the dissertation falls, is then appointed to serve as the candidate's adviser on his dissertation, and to recommend him to the Dean for the final oral examination when, in his judgment, the candidate's dissertation is acceptable.

No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary. Printed copies of detailed regulations regarding the form and reproduction of the dissertation and its summary (see page 57) are available in the Office of the Dean. The summaries of accepted dissertations will be printed in a numbered issue of the University BULLETIN. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of the dissertation.

THE FINAL EXAMINATION

At least three weeks before the degree is to be conferred the candidate must pass an oral examination on his dissertation before a committee of the Faculty appointed by the Dean and supplemented by two experts from outside the University. This examination is open to the public and all are privileged to question the candidate. The Dean, or a member of the Faculty designated by him, will preside at this examination.

THE SCHOOL OF GOVERNMENT

THE FACULTY AND STAFF OF INSTRUCTION*

A. M. Woodruff, *Dean*; J. L. Jessup, *Assistant Dean*

Professors J. W. Brewer, H. F. Bright, D. S. Brown, A. E. Burns, R. D. Campbell, R. H. Davison †, J. C. Dockeray, Mitchell Dreese, D. C. Faith, H. L. Geisert, F. H. Gibbs, Wood Gray, T. W. Holland, Thelma Hunt, G. C. Jacobus (*Research*), J. L. Jessup, A. R. Johnson, E. L. Kayser, R. D. Kennedy, W. H. Kraus, W. K. Legner, H. M. Merriman, R. N. Owens, H. G. Sutton, D. S. Watson, W. R. West, A. M. Woodruff; *Professorial Lecturers* Charles Berns, F. C. Brimacombe, J. L. Buckler, C. W. Clewlow, Gerhard Colm, F. V. Demaret, R. B. Eastin, Hans Heymann, Jr., Frank Higginbotham, C. E. Houston, H. F. Hubbard, J. L. Krieger, Solomon Kullback, Edwin Lewis, K. F. McClure, C. A. McLaughlin, M. E. Ogdon, I. S. Schwartz, F. I. Shaffner, C. L. Simpson, J. N. Stonesifer, K. E. Stromsem, W. G. Torpey, R. A. Young; *Associate Professors* E. C. Acheson, John Clayton, W. C. Davis ‡, R. C. Haskett, J. W. Kendrick, F. C. Kurtz, C. B. Lavell, H. L. LeBlanc, Leonard Prestwich, W. E. Schmidt ‡, Waldo Sommers, Rafael Supervia, R. B. Thompson, H. W. Westermann, H. B. Yakobson; *Associate Professorial Lecturers* F. S. Burin II, L. C. Collins, W. W. Edwards, Robert Kaye, R. A. Kinney, Edward McCrensky, J. P. Murphy, John Provan, F. M. Riddick; *Assistant Professors* W. E. Benson, H. R. Ludden, E. E. Pontius, Jr., J. W. Skinner, R. F. Towson, Jr.; *Lecturers* A. S. Banks, R. J. Bond, J. P. Fitzpatrick, George Idelson, J. A. Morrow, W. D. Neighbors, William Spencer, T. W. Stanley, F. W. Walther; *Associate* R. A. Lucas.

COMMITTEES §

THE DEAN'S COUNCIL ||

1960: J. C. Dockeray, R. B. Thompson; 1961: H. L. LeBlanc, W. E. Benson; 1962: W. H. Kraus, Waldo Sommers

COMMITTEE ON ADMISSION AND ADVANCED STANDING

J. W. Brewer (*Chairman*), D. S. Brown, H. M. Merriman

* The President of the University, the Dean of Faculties, the Dean and Assistant Dean of the School, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, and Assistant Professors constitute the Faculty.

† On leave of absence spring semester 1959-60.

‡ On sabbatical leave spring semester 1959-60.

§ The Dean of the School of Government is a member ex officio of all committees.

|| Elected by the Faculty.

COMMITTEE ON CURRICULUM AND PROGRAMS

R. D. Kennedy (*Chairman*), J. W. Brewer, D. S. Brown, J. C. Dockeray, A. R. Johnson, E. H. Johnson, D. S. Watson

COMMITTEE ON DOCTORAL STUDIES

E. H. Johnson (*Chairman*), J. C. Dockeray, R. D. Kennedy, R. N. Owens, D. S. Watson

EXECUTIVE COMMITTEE, BUREAU OF BUSINESS
AND ECONOMIC RESEARCH

J. C. Dockeray (*Chairman*), E. H. Johnson, R. D. Kennedy, R. N. Owens, D. S. Watson

GENERAL INFORMATION

INTRODUCTORY

The George Washington University has provided training in both foreign service and governmental theory and administration throughout its history. This was one of its purposes when chartered in 1821. The School of Government was established in 1928 to bring together in various undergraduate and graduate curricula the work offered in foreign service and much of the other academic work in the theory and administration of government.

It is the purpose of the School to give the student an understanding of his responsibilities under the Constitution of the United States in the conduct of public office, domestic and foreign, and to prepare students for careers not only in governmental service but also in related business and professional fields. This can be accomplished not through any single course but through curricula which correlate social, economic, political, historical, business, and psychological studies.

The program embraces both graduate and undergraduate work. Curricula leading to the degree of Bachelor of Arts in Government are offered in Foreign Affairs, Public Affairs, Accounting, Business Administration, and Business and Economic Statistics. Graduate work leading to a Master's degree is available in each of these fields and in Economic Policy, Public Administration, Personnel Administration, Counseling, Psychometrics, and Hospital Administration. Graduate study leading to the degree of Doctor of Business Administration is also available (see pages 193-94).

The Foreign Affairs program is broad, covering international political relations, international trade and finance, international communications, and regional studies. Its purpose is to equip students, by providing general background and specialized work, for careers in the field of American foreign relations. The diplomatic service of the United States, the sev-

eral agencies of government with responsibilities in the international field, the international organizations, and American enterprise abroad offer opportunities in this field.

The Public Affairs program is a similar broad, composite curriculum covering the appropriate phases of domestic government and policy.

Governmental service requires special training and background in many other areas, including economic research, statistical investigation, accounting, administrative management, and personnel administration. The academic background for such work is offered in the various curricula of the School and is described below.

REGULATIONS

Students in the School of Government are subject to, and are expected to familiarize themselves with, the regulations concerning ADMISSION, REGISTRARITON, FEES AND FINANCES stated on pages 13-30, and the University regulations stated on pages 52-59.

AMOUNT OF WORK

A full-time student not on probation may take ordinarily not more than 17 semester hours. A student employed more than 24 hours a week, who is not on probation, may take not more than 10 semester hours.

A full-time undergraduate student whose quality-point index is 3.50 or higher may take not more than 19 semester hours. An undergraduate student employed more than 24 hours a week, whose quality-point index is 3.50 or higher, may take up to 12 semester hours.

A student previously unemployed who accepts employment subsequent to registration or at any time during a semester is required to report that fact immediately to the Dean, in order that adjustments in schedule may be made, if necessary, to bring his program within the Faculty's limitations upon the amount of work to be carried by an employed student.

Exception to these rules will require the approval of the Dean.

ATTENDANCE

The student is held responsible for all the work of the courses in which he is registered, and all absences must be excused by the instructor in charge before provision is made for him to make up the work missed.

CLASSIFICATION OF STUDENTS

A student who holds an Associate in Arts degree from the Junior College or the equivalent from another accredited institution, and who has registered his choice of one of the prescribed curricula at the Office of the Registrar, is classed as a *junior*. A student who has completed 30 semester hours in the School of Government is classed as a *senior*. A student who has satisfactorily completed the work for a Bachelor's degree and who has registered his choice of one of the prescribed fields of study at the Office of the Registrar, is classed as a *master in course*.

INDEPENDENT STUDY PLAN

Under the independent study plan a student of demonstrated capacity, with special interest in the subject matter of a course, may be permitted to undertake independent study under the personal direction of an instructor, in accordance with the rules of the department of instruction in which the subject falls. Credit under this plan is limited to the specific course credits as designated in the list of courses of instruction in this CATALOGUE

THE DEGREE OF BACHELOR OF ARTS IN GOVERNMENT

Upon the satisfactory completion of the undergraduate requirements of the School of Government, the degree of Bachelor of Arts in Government, with a designation of the major field of study, is conferred. The major fields are Foreign Affairs, Public Affairs, Accounting, Business Administration, and Business and Economic Statistics.

Students who have a special need for integrating courses from several departments or from more than one major field may request approval, by a faculty committee, of a special major program. The same rules and regulations will apply as in the regularly offered majors.

REQUIREMENTS FOR THE DEGREE

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 52 and 53.

In order to graduate, a student must have the following: (1) a quality-point index in all of his work of at least 2.00 and (2) a quality-point index of at least 2.50 in his major. The major includes the required courses and courses taken in the group options.

Dean's Honor List.—The names of students who achieve a quality-point index of 3.50 or higher will be placed on the Dean's Honor List for that semester. Appearance on the List will be limited to (1) full-time students who have been registered for a minimum of 12 semester hours and (2) part-time students who have been registered for a minimum of 12 semester hours over a period of two consecutive semesters, which may include the summer term.

Probation.—A student must maintain a quality-point index of at least 2.00, or be placed on probation, where he will remain as long as his quality-point index is below 2.00.

Suspension.—A student who has a quality-point index below 1.50 or who is placed on probation for a third semester, whether successive or after an interval, will be suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. He must then submit evidence to

the Committee on Admission and Advanced Standing that during his absence from the University, he has so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

A student with a limited schedule is affected by the foregoing scholarship rules only when he has undertaken 15 semester hours.

RESIDENCE

For residence requirements, see the University regulations on pages 56 and 57.

CURRICULUM REQUIREMENTS

To be recommended by the Faculty for graduation, candidates in the School of Government are required to complete, in addition to the appropriate Junior College Work (see curricula on page 74), a minimum of 60 semester hours during the junior and senior college years, as set forth in one of the following curricula:

	Semester Hours
Foreign Affairs	6
Econ. 181-82... International Economics.....	3
Hist. 150..... European Diplomatic History since 1878 or Pol. Sc. 171. International Politics.....	6
Hist. 181-82... Diplomatic History of the United States.....	3
Pol. Sc. 172... International Organization: The United Nations.....	6
Pol. Sc. 181-82. International Law.....	3
Pol. Sc. 197... Proseminar in Foreign Affairs.....	6
Foreign Language Composition and Conversation.....	3
Geography	15
Group Option .. (To be selected from one of the following groups).....	9
Electives (To be selected in consultation with adviser).....	60
Total.....	60

All foreign affairs majors must complete the *required* courses listed above. The group option provides specialization in international politics, international economics, international communications, or a geographic region, depending upon the student's interest. Normally no more than six semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained for such modification of the option selected.

Group I—International Politics

This group option (15 semester hours as noted in list above) is composed of courses in the departments of Political Science, History, and Geography which are related to the study of American diplomatic relations. The selection of courses must be made in consultation with the adviser.

Group II—International Economic Relations

This group option (15 semester hours as noted in list above) is composed of

courses offered primarily by the departments of Economics and Business and Public Administration which are related to the study of American economic, financial, and business relationships with foreign countries. The selection of courses must be made in consultation with the adviser.

Group III—International Communications

This group option (15 semester hours as noted in list above) is composed of courses offered primarily by the departments of Political Science, Psychology, Sociology and Anthropology, and Journalism which are related to the study of international information programs, public opinion, psychological warfare, cultural relations, and public relations. (It is recommended that the student include statistics in his Junior College program.) The selection of courses must be made in consultation with the adviser.

Group IV—Area or Regional Studies

This group option (15 semester hours as noted in the list above) may be selected from courses offered in the departments of Economics, History, Political Science, and Geography. Integrated programs of study are available in the following regions or areas: Europe and the Middle East, Asia and the Pacific Area, the Soviet Orbit, and Latin America. Modifications and combinations of these areas may be made if approved by the adviser, who must also approve the individual courses selected for the option. The foreign language, noted in list above, should be one that is suitable for study of the region or area selected.

Public Affairs

	Semester Hours
Econ. 121.....Money and Banking.....	3
Econ. 161-62...Public Finance and Taxation.....	6
Econ. 165.....Government Control of Economic Activity.....	3
Hist. 172.....Social History of the United States since 1861	
or Hist. 173...Representative Americans	
or Hist. 176...Political and Constitutional History of the United States since 1861.....	3
Pol. Sc. 121-22...The Constitution of the United States.....	6
Pol. Sc. 145.....Political Parties and Politics.....	3
Pol. Sc. 151-52...Public Administration.....	6
Pol. Sc. 166.....Field Work in Government.....	3
Group Option..(To be selected from one of the following groups).....	15
Electives.....(To be selected in consultation with adviser).....	12
Total.....	60

All public affairs majors must complete the *required* courses listed above. The group option provides specialization in domestic economics or politics. Modifications and substitutions may be made when appropriate or necessary provided the consent of the adviser is obtained.

Group I—Economics Option

	Semester Hours
Econ. 101.....Economic Analysis.....	3
Econ. 105.....Business Cycles.....	3
Econ. 141.....Industrial Relations.....	3
Econ. 142.....Labor Economics.....	3
Hist. 174.....Economic History of the United States.....	3
Total.....	15

	Semester Hours
Group II—Politics Option	
Hist. 175-76.... Political and Constitutional History of the United States...	6
Pol. Sc. 111.... Introduction to Comparative Government.....	3
Pol. Sc. 118.... Political Theory: the Growth of Political Thought in the West	
or Pol. Sc. 120. Foundations of American Democracy.....	3
Pol. Sc. 146.... Political Pressures and Public Reactions	
or Psych. 156. Psychology of Propaganda and Public Opinion.....	3
Total.....	15

	Semester Hours
Business Administration	
Bus. Adm. 101.... Business Organization and Combination.....	3
Bus. Adm. 102.... Fundamentals of Management.....	3
Bus. Adm. 105.... Personnel Management.....	3
Bus. Adm. 131.... Business Finance.....	3
Bus. Adm. 141.... Principles of Marketing.....	3
Bus. Adm. 161.... Commercial Law: Contracts, Sales, Agency, and Bail- ments	3
Bus. Adm. 162.... Commercial Law: Negotiable Instruments, Property, Mortgages	3
Bus. Adm. 198.... Case Problems in Management.....	3
Acct. 193.... Business Budgeting.....	3
Econ. 121.... Money and Banking.....	3
	30
Group Option (to be selected from one of the following groups).....	15
Electives (to be selected in consultation with the adviser).....	15
Total.....	60

All Business Administration majors must complete the *required* courses listed above. The group options shown below provide specialization in several aspects of business. Selection of the option and the courses (15 semester hours) to be taken in it must be made in consultation with the adviser. Normally no more than 6 semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained if the student wishes such modification of his option group.

Group I—General Business

This group option is made up of selected courses offered by the departments of Accounting, Business and Public Administration, Economics, and Statistics.

Group II—Personnel Management

This group option is made up of selected courses offered by the departments of Business and Public Administration, Economics, Psychology, Speech, and Statistics.

Group III—Finance

This group option is made up of selected courses offered by the departments of Accounting, Business and Public Administration, Economics, Political Science, and Statistics.

Group IV—Marketing

This group option is made up of selected courses offered by the departments of Business and Public Administration, Economics, Geography, and Statistics.

Group V—Controllership

This group option is made up of selected courses offered by the departments of Accounting, Business and Public Administration, and Economics.

Group VI—Economics

This group option is made up of selected courses offered by the departments of Economics and Business and Public Administration.

Group VII—Statistics

This group option is made up of selected courses offered by the Department of Statistics.

Group VIII—Transportation and Public Utilities

This group option is made up of selected courses offered by the departments of Business and Public Administration, Economics, Geography, History, and Statistics.

Foreign Commerce.—Business Administration majors who wish to specialize in foreign commerce may request a modification of the above requirements. The modified major excludes some of the above required courses and adds others, such as a third year of foreign language, foreign markets, exporting and importing, economic geography, and other courses relating to overseas trade. Each program must be approved by the adviser.

Accounting		Semester Hours
Acct. 101.....	Cost Accounting.....	3
Acct. 111.....	Financial Statement Analysis.....	3
Acct. 121-22.....	Intermediate Accounting.....	6
Acct. 132.....	Accounting Theory.....	3
Acct. 171.....	Auditing.....	3
Acct. 181.....	Accounting Systems.....	3
Acct. 193.....	Business Budgeting.....	3
Bus. Adm. 102.....	Fundamentals of Management.....	3
Bus. Adm. 131.....	Business Finance.....	3
Bus. Adm. 161.....	Commercial Law: Contracts, Sales, Agency, and Bail- ments.....	3
Bus. Adm. 162.....	Commercial Law: Negotiable Instruments, Property, Mortgages.....	3
Econ. 121.....	Money and Banking.....	3
Group Option (to be selected from one of the following groups).....		39
Electives (to be selected in consultation with the adviser).....		15
Total.....		60

All Accounting majors must complete the *required* courses listed above. The group options shown below provide specialization in public accounting, commercial and industrial accounting, and governmental accounting and budgeting. Selection of the option and the courses (15 semester hours) to be taken in it must be made in consultation with the adviser.

Group I—Public Accounting

This group option is made up of selected courses offered by the departments of Accounting, Business and Public Administration, and Political Science.

Group II—Commercial and Industrial Accounting

This group option is made up of selected courses offered by the departments of Accounting, Business and Public Administration, Economics, and Statistics.

Group III—Governmental Accounting and Budgeting

This group option is made up of selected courses offered by the departments of Accounting, Business and Public Administration, Political Science, and Economics.

		Semester Hours
Business and Economic Statistics		
Stat. 111.....	Business and Economic Statistics I.....	3
Stat. 112.....	Business and Economic Statistics II.....	3
Stat. 117.....	Analysis of Variance I.....	3
Stat. 118.....	Correlation and the Chi-square Test I.....	3
Stat. 195-96....	Reading and Research in Business and Economic Statistics	6
Bus. Adm. 101..	Business Organization and Combination.....	3
Bus. Adm. 102..	Fundamentals of Management.....	6
Econ. 101-2....	Economic Analysis.....	3
Econ. 105.....	Business Cycles.....	6
Electives (A) ..	(To be selected from Statistics).....	21
Electives (B) ..	(From Accounting, Business Administration, Economics, and Statistics in consultation with the adviser).....	60
Total.....		

EXAMINATIONS FOR WAIVING CURRICULUM REQUIREMENTS

A student wishing to omit a required course may take such examination as the department prescribes, and, on passing satisfactorily, he may be relieved of the curriculum requirement in that subject and may qualify for registration in an advanced course. Passing of this examination does not entitle the student to any hours of credit toward the degree. A student desiring to take such examinations should make the request of the Dean and pay the required fee.

GRADUATE RECORD EXAMINATIONS

During the final semester of the senior year students in the School of Government are required to take the following Graduate Record Examinations: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and Area Tests (achievement), which measure breadth of knowledge and understanding in three broad areas of the liberal arts: Natural Science, Social Science, and the Humanities. (For further information concerning the Graduate Record Examinations, see page 57.)

THE MASTER'S DEGREES

Upon the satisfactory completion of the graduate requirements of the School of Government, one of the following degrees is conferred: (1) Master of Arts in Government with a major in Foreign Affairs, Public Affairs, Economic Policy, Accounting, Business and Economic Statistics,

Counseling, or Psychometrics; (2) Master of Arts in Public Administration; (3) Master of Arts in Personnel Administration; (4) Master of Business Administration ((a) in general business administration; (b) in the field of Hospitalization.)

ADMISSION TO CANDIDACY

A student is formally recognized as a candidate for the Master's degree only when his application for candidacy has been approved.

A 3.00 average in the undergraduate major is normally required for admission to graduate study.

The candidate for the Master's degree who is deficient in undergraduate preparation may take a comprehensive examination on his undergraduate major field. Passing of this examination entitles the student to admission without taking specific courses to make up his deficiencies.

In courses taken to satisfy undergraduate deficiencies, the student must maintain at least a 3.00 average to be eligible for admission to graduate study.

Candidates for the Master of Arts degree in Foreign Affairs, Public Affairs, or Economic Policy must show a reading knowledge (certified by the appropriate language department) of at least one modern foreign language, to be approved by the Dean. Such examination should be taken before the student begins the second 15 hours of his work. No student will be permitted to take the examination after three unsuccessful attempts.

REQUIREMENTS FOR THE DEGREES*

A minimum of 30 semester hours of work, as outlined in the curricula on pages 187-89, must be completed successfully. Variations from these curricula require the permission of the Dean.

No part of the minimum requirements may be taken in any other institution.

A second-group course (numbered 101-200) may be counted toward the Master's degree only when registration for advanced credit has been approved at the beginning of the course by the Dean and by the officer of instruction, and provided that the student has done such extra work in the course as may be prescribed by the instructor.

All work for the Master's degrees must be completed in three years, unless an extension of time is granted by the Dean's Council. Validation examinations may be required.

In addition to the course examinations, the candidate must pass a comprehensive written examination in his major field. These examinations are scheduled two or more times a year (usually in December and in April), and should be taken shortly before or shortly after the completion

* Requirements for the degree of Master of Business Administration with a field of concentration in Hospital Administration are stated on pages 192-93.

of the prescribed course work. The candidate must consult with his adviser, well in advance, as to the date of his examination and the definition of the subject-matter fields which this examination is to cover. An oral examination on his thesis may also be required.

No work counted toward a Bachelor's degree may be counted toward a Master's degree.

A student who expects to continue his studies for the degree of Doctor of Philosophy (Graduate Council) or Doctor of Business Administration, after receiving the Master's degree, will be assisted in planning his program so that he may qualify for admission to candidacy for the Doctorate.

RESIDENCE

No credit is granted for work done *in absentia*, i.e., without formal instruction, except for the thesis, which may be completed *in absentia* with the permission of the department or committee concerned.

SCHOLARSHIP

Grades for graduate work are *E*(excellent), *S*(satisfactory), and *U*(unsatisfactory); for further details, see pages 52-53. A minimum of 6 of the first 30 semester hours of course work completed in the Master's program must be graded *E*.

A Master's candidate who has accumulated more than 6 semester hours of *U* will be automatically suspended.

CURRICULUM REQUIREMENTS

A normal program includes a minimum of 24 semester hours of course work and the thesis (6 semester hours), to be selected from the courses listed under the chosen major field, and such other courses as may be necessary. Programs should be prepared in advance in consultation with the adviser and submitted to the Dean on the appropriate form; if the program is not completed at the time of registration this must be attended to not later than one month following registration.

THE THESIS

Students who plan to complete work for a Master's degree in one year should register for the thesis at the beginning of the year; otherwise the thesis should be registered for not later than the beginning of the final year. The choice of the thesis subject must be approved by the professor in charge and recorded in the Office of the Registrar by the date announced in the University calendar. The thesis in its final form must have the approval of the professor in charge and must be presented to the Dean by the student no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and

reproduction of the thesis (see page 57) are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year is granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period, it must be registered for again, and tuition paid on the same basis as for a repeated course.

MASTER OF ARTS IN GOVERNMENT

This degree is offered in seven different curricula which are described below.

Students who have a special need for integrating courses from two or more of the major fields of concentration for the degree of Master of Arts in Government may request approval, by a faculty committee, of a special major program. All rules and regulations for the degree of Master of Arts in Government will apply to such special programs.

FOREIGN AFFAIRS

Prerequisite: an undergraduate major in foreign affairs, economics, history, or political science, depending upon the field of specialization. Any course deficiency in foreign affairs must be made up.

The program in Foreign Affairs is offered in four fields of specialization: International Economics, International Politics, International Communications, and Regional Studies.

International Economics.—Graduate courses in economics (numbered over 200) in the field of international trade, the balance of payments, international financial policies, and international economic policies form the principal part of this specialization. Graduate courses in economic theory are recommended. Other courses may be included with the consent of the adviser.

International Politics.—Graduate courses in political science and history (numbered over 200), in international law, international politics, international organization, diplomatic history, and American foreign policy, comprise the principal requirements for this specialization. Related courses may be added with the consent of the adviser.

International Communications.—Graduate courses (numbered over 200) in political science, psychology, sociology and anthropology, and geography with 12 hours (one-half of the course work) in the fields of public opinion, international information, psychological warfare, and communications, and 12 hours (one-half of the course work) in the fields of international politics and area studies. The adviser in all cases must approve the course selections.

Regional Studies.—Graduate courses in economics, political science, history, and geography (numbered over 200) dealing with a geographic region, such as Latin America, Europe and the Middle East, Asia, the Soviet Orbit, or the Pacific Area, comprise the principal requirements. Other courses of broader scope in economics, history, and political science are recommended as part of the program. The adviser in all cases must approve such selections.

The listing of graduate courses for these fields of specialization is given in the

departmental offerings for Economics, History, Political Science, Geography, Psychology, and Sociology and Anthropology.

PUBLIC AFFAIRS

Prerequisite: an undergraduate major in public affairs, economics, history, or political science, depending upon the field of specialization. Any course deficiency in the Public Affairs Curriculum, as stated on page 181 must be made up.

The program in Public Affairs is offered in two fields of specialization: Domestic Economics and Domestic Politics.

Graduate course required of all students: Political Science 205-6, The Federal Executive.

Recommended for Domestic Economics: courses in economic development, economic policy, public finance, and national income.

Recommended for Domestic Politics: courses in United States social, constitutional, and political history; comparative government; political theory; legislative organization; jurisprudence; political parties; and public opinion.

ECONOMIC POLICY

Prerequisite: an undergraduate major in economics or the equivalent.
Graduate course in economics required: Economics 265-66, Theory of Economic Policy.

Recommended: courses in income and employment, national income, business cycles, monetary and fiscal policy, economic theory, and statistics. These courses and others that may be appropriate are to be selected with the consent of the adviser.

ACCOUNTING

Prerequisite: an undergraduate major in accounting or the equivalent. The program in Accounting requires the following courses:

	Semester Hours
Acct. 231.....Contemporary Accounting Theory.....	3
Acct. 295-96.....Seminar in Accounting.....	6
Acct. 299-300.....Thesis	6

Of the remaining 15 semester hours, 9 must be in accounting and 6 in related fields selected with the approval of the adviser.

BUSINESS AND ECONOMIC STATISTICS

Prerequisite: an undergraduate major in business and economic statistics, or the equivalent; such work must include a minimum of 24 semester hours of second-group courses in statistics and a minimum of 18 semester hours in second-group courses in accounting, business administration, and economics.

The Master of Arts program requires at least 12 semester hours of graduate courses in statistics. The remaining 12 semester hours are to be selected from graduate work offered by the departments of Accounting, Business and Public Administration, Economics, and Statistics with the approval of the adviser.

COUNSELING

Prerequisite: an undergraduate major in psychology, business administration, or education; or an undergraduate major in the social sciences appropriate to specialization in this field. The undergraduate background should include necessary basic

training in such fields as psychology, sociology, statistics, labor economics, and business management or public administration.

The Master of Arts program in Counseling requires the following courses:

	Semester Hours
Psych. 220..... Seminar: Abnormal Psychology	
or	
Psych. 225..... Seminar: Mental Hygiene.....	3
Psych. 227..... Seminar: Counseling and Guidance.....	3
Psych. 228..... Seminar: Techniques of Counseling.....	3
Psych. 229..... Seminar: Occupational and Educational Infor- mation	3
Psych. 236..... Seminar: Analysis of the Individual for Pur- poses of Counseling.....	3

The remaining 9 hours are elective, with the approval of the adviser.

PSYCHOMETRICS

Prerequisite: an undergraduate major in psychology, statistics, or the social sciences which includes twelve credits in psychology (general psychology, tests and measurements, personnel psychology, and related psychology courses); general statistics; mathematics through college algebra (preferably through calculus).

The Master of Arts program in Psychometrics requires the following courses:

	Semester Hours
Psych 231..... Test Construction.....	3
Psych. 234..... Seminar: Test Theory.....	3
Psych. 246..... Seminar: Personnel Measurement Techniques .	3
Psych. 299-300..... Thesis	6
Stat. 105..... Statistics in Psychology and Education.....	3
Stat. 117..... Analysis of Variance I.....	3
Stat. 118..... Correlation and the Chi-square Test I.....	3

The remaining 6 hours are elective, with the approval of the adviser.

MASTER OF ARTS IN PUBLIC ADMINISTRATION

The purpose of the program in Public Administration is to prepare graduates to enter public service in the field of administration and to improve the competence of those already in public employment. The program assumes that effective performance at all levels of administration calls for an understanding of the human factors involved, a knowledge of the nature and institutional characteristics of administration in the public service, and an ability to apply the methods and techniques of management. An understanding of all three elements is provided by bringing together into the program different disciplines, including courses in political science, business and public administration, psychology, economics, accounting, and statistics.

Prerequisite: an undergraduate background in the social sciences, business administration or, in the absence of such course work, appropriate experience in government service.

The candidate for the degree must successfully complete a minimum of 30 hours at the graduate level. This will include 6 hours of thesis. Of the remaining 24

semester hours, students must select at least 6 hours from each of the three groups indicated below, and such other courses as are necessary to complete the program. Selection of all courses by the student must have the approval of the adviser.

GROUP I. HUMAN FACTORS IN ADMINISTRATION

	Semester Hours
Bus. Adm. 288.....Executive Leadership.....	3
Psych. 228.....Seminar: Techniques of Counseling.....	3
Pub. Adm. 231.....Public Personnel Management.....	3
Pub. Adm. 232.....Personnel Procedures and Problems.....	3
Pub. Adm. 233.....Seminar in Manpower Development and Utilization.....	3
Pub. Adm. 237.....Intermediate Management and Supervision.....	3
Pub. Adm. 241.....Human Relations in Governmental Administration.....	3
Pub. Adm. 272.....Reading and Conference Course in Public Personnel Administration.....	3

GROUP II. METHODS AND TOOLS OF MANAGEMENT

	Semester Hours
Acct. 141.....Governmental Accounting.....	3
Acct. 246.....Governmental Accounting and Budgeting Problems.....	3
Bus. Adm. 109.....Office Management.....	3
Bus. Adm. 268.....Management Engineering.....	3
Psych. 255.....Seminar: Techniques of Opinion and Attitude Measurement.....	3
Pub. Adm. 215.....Seminar in Comparative Administrative Systems.....	3
Pub. Adm. 216.....Management Analysis and Methods Improvement.....	3
Pub. Adm. 217.....New Tools of Management.....	6
Pub. Adm. 221-22.....Staff Functions in Government.....	3
Pub. Adm. 254.....Controllership in the Federal Services.....	3
Pub. Adm. 259.....Government Procurement and Property Management.....	3
Stat. 109.....Managerial Statistics.....	3

GROUP III. PROGRAM MANAGEMENT AND POLICY DIRECTION

	Semester Hours
Bus. Adm. 102.....Fundamentals of Management.....	3
Bus. Adm. 286.....Management in the Armed Forces.....	6
Econ. 261-62.....Public Finance and Fiscal Policy.....	3
Econ. 266.....Theory of Economic Policy.....	3
Pol. Sc. 162.....Administrative Law.....	3
Pub. Adm. 210.....The Management Function.....	3
Pub. Adm. 211.....Problems of Governmental Organization.....	3
Pub. Adm. 212.....Case Studies in Administration.....	6
Pub. Adm. 225-26.....Internship in the Administrative Processes.....	3
Pub. Adm. 251.....Governmental Budgeting.....	3
Pub. Adm. 252.....Seminar in Planning and Programming.....	3
Pub. Adm. 260.....Seminar in Policy Formulation and Administration.....	3

	Semester Hours
Pub. Adm. 261.....Public Opinion and the Administrator.....	3
Pub. Adm. 262.....Contemporary Administrative Theory and Practice	3
Pub. Adm. 271.....Reading and Conference Course in Public Management and Administration.....	3

MASTER OF ARTS IN PERSONNEL ADMINISTRATION

The purpose of the program for the degree of Master of Arts in Personnel Administration is to train graduates in personnel management techniques and problems. While the emphasis is placed on governmental personnel work, the curriculum may be adapted to the interest of graduates who plan a career in personnel relations in business.

Prerequisite: an undergraduate background in the social sciences or, in the absence of such course work, appropriate experience in personnel work. Specific course prerequisites will be required.

In addition to the thesis, the program requires 24 graduate credits, in general developed from the following, with the approval of the adviser:

	Semester Hours
Bus. Adm. 291-92....Seminar in Business Management.....	6
Econ. 241.....Labor Economics.....	3
Econ. 244.....Collective Bargaining.....	3
Psych. 227.....Seminar: Counseling and Guidance.....	3
Psych. 244.....Seminar: Job Analysis and Evaluation.....	3
Psych. 245.....Seminar: Employee Motivation and Morale..	3
Psych. 246.....Seminar: Personnel Measurement Techniques.	3
Pub. Adm. 210.....The Management Function.....	3
Pub. Adm. 231.....Public Personnel Management.....	3
Pub. Adm. 232.....Personnel Procedures and Problems.....	3
Pub. Adm. 233.....Seminar in Manpower Development and Utili- zation	3
Pub. Adm. 241.....Human Relations in Governmental Adminis- tration	3
Pub. Adm. 272.....Reading and Conference Course in Public Per- sonnel Administration.....	3

MASTER OF BUSINESS ADMINISTRATION

IN GENERAL BUSINESS ADMINISTRATION

This curriculum provides the graduate student with the general and specialized training which will help him advance to responsible positions in business. The program is also valuable for many positions in government, particularly those in "business-type" operations.

The Master of Business Administration program is sufficiently flexible to meet the basic requirements of any vocational objective requiring a knowledge of management principles. While most students in this program will normally take Business Administration 201, Advanced Management, and Business Administration 291-92, Seminar in Business Management, and other courses in Business Administration, the individual pro-

gram should be planned with an adviser so as to include graduate courses offered by other departments wherever appropriate. Particular attention should be given the offerings under Public Administration, Economics, Accounting, Statistics, and Psychology.

The degree of Master of Business Administration is granted upon successful completion of 24 hours of course work and 6 hours of *Thesis*. An individual program should be planned in consultation with an adviser.

The thesis area as well as the thesis subject should be selected as early as possible so as to permit effective integration with the course work. Students who do not present a satisfactory undergraduate major will be required to take prerequisite courses, which will be selected in accordance with individual qualification and work experience.

IN THE FIELD OF HOSPITAL ADMINISTRATION

The purpose of this program is to give students an opportunity to acquire the knowledge, attitudes, and skills which will provide a foundation for their growth into capable administrators of hospitals and related institutions.

Work for the degree is divided into two phases. During the first phase a minimum of thirty-six semester hours of academic courses, adapted in accordance with each student's background and needs, must be completed. These courses cover the general and technical background of hospital administration, general administrative theory and practice, and problem solving in the area of management as it relates to hospitals.

The second phase includes the hospital training and the written report, in the form of a thesis, on a research project assigned at the beginning of the phase. By special permission, additional research and course work may be substituted for a part of the clinical training. Each program is made out for the individual student in accordance with his experience, needs, and aim.

Full-time students ordinarily should complete both phases for the degree in twenty-one months; *part-time students* in thirty-six months. Under special circumstances, additional time may be authorized.

Prerequisite: a Bachelor's degree from an accredited college or university, with a *B* average in the undergraduate major. Consideration is given in the selection of candidates to personal qualifications, aptitude for hospital administration, and practical experience.

The program requires a minimum of 45 semester hours of graduate courses; twenty-one months of residence, including a calendar year of hospital training under qualified supervision; and a research report. The following courses are required:

	Semester Hours
*Bus. Adm. 201.....Advanced Management.....	3
*Bus. Adm. 268.....Management Engineering.....	3

* Students with credit for this course may substitute an approved graduate course.

	Semester Hours
Hosp. Adm. 202.....Introduction to Hospitalization.....	3
Hosp. Adm. 203.....Hospitalization I.....	3
Hosp. Adm. 204.....Hospital Administration II.....	3
Hosp. Adm. 205.....Studies in Hospital Management I.....	3
Hosp. Adm. 206.....Studies in Hospital Management II.....	3
Hosp. Adm. 207.....Hospital Management Methods.....	3
Hosp. Adm. 208.....Residency Year.....	9

The remaining 12 hours are elective, with the approval of the adviser.

DOCTOR OF BUSINESS ADMINISTRATION

The work for this degree is under the supervision of the Committee on Doctoral Studies of the School of Government.

An applicant must have the degree of Master of Business Administration, Master of Arts in Business Administration, or Master of Arts in a related field, or the equivalent of such degrees, together with acceptable personal qualities and a capacity for creative scholarship. Each applicant must demonstrate his competence in Statistics and Accounting by qualifying examinations.

After admitting an applicant, the Committee on Doctoral Studies, in consultation with the applicant, will designate six fields of study and appoint an adviser to guide the student in his work in these fields. As part of this work, the student must complete a minimum of 30 semester hours in graduate courses. Additional course work may be prescribed by the adviser.

When the applicant has satisfied his adviser and the Committee of his readiness to take the General Examination, this Examination will be scheduled.

The General Examination is a written comprehensive on fields of study not limited to the subject matter of courses taken in these fields. Two fields of study are required of all applicants: Economic Theory and Business and Economic History. The four additional fields, selected by the Committee and the applicant, will be drawn from the following list: Marketing, Organization and Management, Business Finance and Investments, Personnel Management, Public Administration, Accounting Theory, Money and Banking, Statistics, Transportation and Traffic Management, and such others as the Committee may designate.

Upon successful completion of the General Examination and approval of the subject of the doctoral dissertation, the student may be admitted to candidacy by the Committee on Doctoral Studies. The candidate's research and the preparation of his dissertation are supervised by a Research Adviser designated by the Committee.

THE DISSERTATION

No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation

together with a fourth copy of the summary. It is the responsibility of the candidate for a Doctoral degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the dissertation, which are rigidly enforced. The summaries of accepted dissertations will be printed in a numbered issue of the University BULLETIN. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

THE FINAL EXAMINATION

The Final Examination of the candidate consists of his oral defense of the dissertation. The examination will be given by a committee appointed by the Committee on Doctoral Studies. Upon successful completion of this oral examination the candidate will be approved for the degree of Doctor of Business Administration by the Committee on Doctoral Studies.

SPECIAL PROGRAMS

The Government Management Intern Scholarship Program offers annually fifty scholarships to assist federal agencies in training carefully selected young men and women for administrative leadership in government career service. Each scholarship provides a tuition-free course of 3 hours a semester and appropriate academic credit (up to 6 semester hours) for the successful completion of training assignments required in any agency which has been evaluated by the University.

The Navy Graduate Comptrollership Program, sponsored by the Naval Post Graduate School, provides 50 semester hours of work in comptrollership and related fields for a selected group of Naval and Marine officers. The Master's degree is awarded upon successful completion of this full-year program.

The Air Force Advanced Management Program, sponsored by the United States Air Force Institute of Technology, provides 50 semester hours of work in advanced management and supporting fields for a selected group of Air Force officers. Most of the officers receive the Master's degree upon successful completion of this full-year program.

The School of Government cooperates with the College of General Studies in the Off-Campus program of that College, particularly in the fields of controllership, governmental administration, and personnel administration.

The Department of Business and Public Administration offers work in the field of property and casualty insurance as part of the educational program of the American Institute for Property and Liability Underwriters, Inc.

BUREAU OF BUSINESS AND ECONOMIC RESEARCH

The Bureau, as part of the School of Government, was established to conduct research in both the fields of business and economics. This work is under the direction of the Executive Committee of the Bureau of Business and Economic Research. Special attention is given to problems of the metropolitan area of Washington, D. C. Research projects are also sponsored by public and private agencies. Both faculty and students of the School of Government participate in the activities of the Bureau of Business and Economic Research. Results of research activities as well as abstracts of selected Masters' theses are reproduced and disseminated by the Bureau.

THE COLLEGE OF GENERAL STUDIES*

G. L. Angel, *Dean*; W. H. Hayes, Jr., *Assistant Dean*; R. W. Eller, *Director, Campus Division*; R. C. Rutledge, *Director, Off-Campus Division*; M. E. Coleman, *Director, Reading Clinic*

COMMITTEES†

THE DEAN'S COUNCIL‡

1960: R. D. Campbell, C. H. Walther; 1961: A. R. Johnson, B. S. Root; 1962: D. C. Faith, B. D. Van Evera

COMMITTEE ON UNDERGRADUATE ADMISSION AND ADVANCED STANDING
G. L. Angel (*Chairman*), J. C. Dockeray, J. W. Harkness, L. P. Leggette, G. E. McSpadden, H. W. Westermann, J. Y. Ruth (*ex officio*)

COMMITTEE ON GRADUATE STUDIES

G. L. Angel (*Chairman*), D. S. Brown, I. B. Hansen, A. R. Johnson, J. N. Mosél, F. S. Tupper, J. Y. Ruth (*ex officio*)

COMMITTEE ON SCHOLARSHIP

W. H. Hayes, Jr. (*Chairman*), H. G. Detwiler, F. M. Mears, R. F. Towson, F. R. Houser (*ex officio*)

COMMITTEE ON CURRICULUM AND PROGRAMS

B. D. Van Evera (*Chairman*), J. H. Coberly, R. W. Stephens

GENERAL INFORMATION

The College of General Studies was established in 1950. The objectives of the College are to extend the adult education facilities of the University; to introduce experimental procedures in conducting programs of study for mature students; and to provide auxiliary courses not included in formal programs of study, in response to community interest. The college includes the Off-Campus Division, the Campus Division, and the Division of Community Services.

OFF-CAMPUS DIVISION

The Off-Campus Division works closely with personnel administrators, training officers, school officials, and others interested in developing programs of in-service training or off-duty education for employees in de-

* This listing of Administrative Officers is for 1959-60.

† The Dean and Assistant Dean are members *ex officio* of all committees.

‡ The Dean of Faculties, the Dean and Assistant Dean in the College are members *ex officio* of the Council.

partments of the Federal Government, business and industry; for people working in the fields of education; and for service personnel in nearby military installations. Credit and noncredit courses are organized in any liberal arts field in which there is sufficient demand and for which instructional facilities can be made available. These courses meet at the time and place most convenient for the students enrolled and may begin at any time of the year. In cooperation with Channel 9, WTOP-TV, credit and noncredit television courses are offered.

Credit courses may be applied toward a degree in any college or school of the University provided (1) the student is accepted for degree candidacy in that school or college, (2) the courses meet the curriculum requirements of the school or college, and (3) the number of semester hours earned in the College of General Studies does not exceed the maximum allowed in transfer by the school or college concerned. Credit courses may be transferred to other colleges and universities.

ADMISSION TO COURSE WORK

Admission to an off-campus course does not constitute admission to degree candidacy or permission to attend classes on campus.

A simplified procedure for admission and registration in off-campus courses is conducted at or prior to the first meeting of the class. Transcripts of previous academic work are not required. Registration in credit courses is restricted to those whose qualifications indicate that they are able to complete the course successfully. Degree students enrolled in any other college, school, or division of the University may take credit courses in the College of General Studies *only by permission of the dean* of the college, school, or division concerned. In general, off-campus noncredit courses are open to any individual interested in enrolling. However, when a course is organized at the request of some particular agency or group, admission may be restricted to the students recommended by the sponsoring organization. A limit on the size of classes may have to be imposed in order to maintain the quality of instruction.

ADMISSION TO DEGREE CANDIDACY

Application for degree candidacy should be made only if there is a reasonable assurance that the student will be in the area long enough to complete the requirements. Credits granted by this College for the General Educational Development tests and for service schools and correspondence courses may or may not be accepted by another institution or other schools and colleges of this University.

The following factors are considered in determining the eligibility of an applicant:

1. The adequacy of previous academic work as preparation for the course of study contemplated, including quantity and quality of work and the standing of the institution in which it was done.

2. Results of specified tests, when prescribed by the Committee on Admissions.

3. The aptitude of the student for the curriculum contemplated.

4. The character of the student.

In agencies and service installations where there is sufficient enrollment to permit offering the necessary range of courses, it is possible, without campus study, to earn the following degrees: Associate in Arts, Associate in Science, Bachelor of Arts, Bachelor of Science in Cartography, and Master of Arts in the fields of Controllershship, Governmental Administration, and Personnel Management.

CAMPUS DIVISION

The Campus Division is designed for promising adults with unusual backgrounds who merit the individual consideration made possible by this Division's experimental approach to admission, advanced standing, curricula, and evaluation of achievement. The criteria of eligibility for admission are stringent in order to limit matriculation to (1) adults well qualified to undertake college work but lacking certain academic requirements for admission to other degree-granting schools and colleges of the University and (2) adults who, through work experience, have gained broad knowledge and high competency in some area of learning. This knowledge may be validated by special examination to gain advanced standing toward a degree.

REQUIREMENTS FOR ADMISSION

The applicant must meet the following requirements:

1. He must be an adult who has achieved outstanding success in his vocation.

2. He must have completed, with the grade of at least C +, 12 semester hours in the Off-Campus Division, the Division of University Students, or the Division of Special Students. The student who has completed a substantial amount of college work elsewhere with excellent grades may apply for admission to degree candidacy after 6 semester hours at The George Washington University.

3. He must present valid reasons for selecting degree candidacy in the Campus Division of the College of General Studies rather than in another school or college of the University.

4. He must enroll for at least two courses a semester on Campus. Full-time study is encouraged.

DEGREES

The Campus Division offers programs leading to the degrees of Associate in Arts and Bachelor of Arts. In cooperation with Columbian Col-

lege, the School of Education, and the School of Government, the Campus Division makes available programs leading to the degree of Bachelor of Arts, with majors in the liberal arts and sciences, and in various subject-matter fields in education and government. Students selecting these majors must satisfy the prerequisite course requirements prior to admission to candidacy or take them as additional work after being admitted.

ARMED FORCES SECTION

The Armed Forces Section of the Campus Division was established for those service personnel who wish to study full-time at the University and who have only a limited time under military orders in which to complete their programs of study. Such students register for campus courses through the College of General Studies and remain under its administrative and academic control. By permission of the Dean they may enroll in appropriate courses in the Off-Campus Division.

Military and naval personnel are eligible for admission to this section of the Campus Division if they meet the following requirements:

1. The applicant must be in attendance under official orders which give him a specified time in which to finish his degree requirements.
2. He must prove that the degree requirements can be completed in the time specified in his orders only by taking advantage of the advanced standing provisions of this College.
3. He must be in a position to enroll for full-time study.

By special arrangements with the Department of the Navy, a naval section of the Armed Forces Section has been established. All naval personnel attend the University as full-time students, ordinarily for five semesters.

The Air Force Advanced Management Program, sponsored by the United States Air Force Institute of Technology, provides 50 semester hours of work in advanced management and supporting fields through the educational facilities of the School of Government for a selected group of Air Force officers. Those officers who qualify by a combination of academic background and the satisfactory completion of this program can be awarded a Bachelor's degree by the College of General Studies. Those with Bachelor's degrees can take these courses for graduate credit to be applied toward the degree of Master of Arts in the field of Governmental Administration.

REGULATIONS

Students in the Campus Division of the College of General Studies are subject to and are expected to familiarize themselves with the regulations of the University as stated on pages 13-30 and 52-59, as modified in the separate catalogue of the College of General Studies.

DIVISION OF COMMUNITY SERVICES

This Division was organized to provide needed auxiliary educational services and to promote programs designed to supplement the formal educational offerings of the University.

Noncredit courses in a wide variety of subject fields are set up at the request of any interested group. There are no entrance requirements. The length of each course is determined by the wishes of the sponsoring group and the nature of the subject to be studied.

The George Washington University Reading Clinic offers both diagnostic and corrective work for small groups or individuals and reading improvement techniques for small classes. All courses are designed to meet particular individual needs whether on a remedial basis or for accelerated reading comprehension. (See page 215.)

FEES

The tuition fee for off-campus credit courses is \$17 a semester hour; for campus courses, \$24 a semester hour. The tuition fees for noncredit courses are determined by the length and nature of the course.

Fees for noncredit courses and eight-week credit courses are payable in full at the first meeting of the course. By special arrangement, payment for fifteen-week credit courses may be made in three equal installments.

For complete information concerning the College of General Studies, see the separate catalogue which is available upon request to the College of General Studies, 706 Twentieth Street NW.

THE DIVISION OF UNIVERSITY STUDENTS*

E. L. Kayser, *Dean*; J. G. Allee, Jr., *Associate Dean*

THE DEAN'S COUNCIL†

I. B. Hansen, F. E. Johnston, R. D. Kennedy

GENERAL INFORMATION

INTRODUCTORY

The Division of University Students was established in 1930. In this Division are registered mature students who wish to undertake university courses for credit either here or elsewhere or as auditors, but who are not at this time working toward degrees in this University.

REGULATIONS

Students in the Division of University Students are subject to, and are expected to familiarize themselves with, the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 13-30; the University regulations stated on pages 52-59; and the regulations concerning PROBATION AND SUSPENSION which are the same as those stated on pages 67-68 under the Junior College.

TRANSFER TO REGULAR STATUS

A "University student" may be transferred, at his request, to another college or school of the University only upon complying with the regulations of the specific college or school to which he wishes to transfer. The student should familiarize himself with the regulations printed in the University CATALOGUE concerning admission, residence, amount and quality of work. He should also specifically note the University regulations regarding transfers within the University on pages 54-55, and regarding graduation requirements on pages 56-58, and observe that when a student transfers into a degree-granting school or college, to be eligible for a degree he must meet not only all the general graduation requirements, but also special requirements as may apply in his particular curriculum.

* This listing of Administrative Officers is for 1959-60.

† The Dean of Faculties, the Dean and the Associate Dean of the Division are members ex officio of the Council.

THE DIVISION OF SPECIAL STUDENTS

W. R. West, *Dean*

THE DEAN'S COUNCIL*

Thelma Hunt, A. C. Murdaugh, F. S. Tupper

GENERAL INFORMATION

INTRODUCTORY

The Division of Special Students was organized in 1944. To this Division may be admitted students who are in the process of qualifying for degree candidacy. Students in this Division are designated "special students".

REGULATIONS

Students in the Division of Special Students are subject to, and are expected to familiarize themselves with, the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 13-30; and the University regulations stated on pages 52-59.

SCHOLARSHIP

A student in this Division may be dropped for reasons of scholarship if his quality-point index falls below 2.00.

The system of grading and computing scholarship is described in detail on pages 52 and 53.

ACADEMIC SCHEDULE

The schedule of the "special student" is made up of courses required in the curriculum to which he wishes to transfer. The choice of courses must be approved by the Dean. If the student has not completed the language requirements of this curriculum at the time of his admission to the University, he must include three hours of language in each twelve hours of work until this requirement is met. Second- or third-group courses may not be taken unless all first-group requirements have been met or are being met concurrently.

Credits earned at other institutions are evaluated at the time of admission to this Division. They are withheld until the "special student" transfers to a degree-granting college or school, when those appropriate to his curriculum are applied toward advanced standing.

In each individual case, the schedule will be reduced when it is deemed advisable.

* The Dean of Faculties, and the Dean of the Division are members ex officio of the Council.

TRANSFER TO REGULAR STATUS

A "special student" may transfer to a degree-granting college or school of the University when he has satisfactorily completed his program in the Division of Special Students and has met the admission requirements of the college or school to which he wishes to transfer. The student should familiarize himself with regulations printed in the University CATALOGUE concerning admission, residence, amount and quality of work. He should also specifically note the University regulations regarding transfer within the University on pages 54-55 and regarding graduation requirements on pages 56-58, and observe that when a student transfers into a degree-granting school or college, to be eligible for a degree he must meet not only all the general graduation requirements, but also such special requirements as may apply in his particular curriculum.

ADVISORY SYSTEM

Students in the Division of Special Students are expected to consult with an adviser in the Office of the Dean at least once each semester. Any student who has a question in regard to his status, or whose grades are below *C*, or who is in academic difficulty, is urged to make an appointment promptly without waiting for a request from the Dean.

DIVISION OF AIR SCIENCE

E. M. Wall, *Director*

MILITARY SERVICE DELAY AND AIR FORCE ROTC ADVANCED COURSE
SELECTION BOARD*

J. L. Gagnier (*Chairman*), G. M. Koehl, C. D. Linton, T. G. Martin,
M. A. Mason, W. W. Richardson III (*Recorder*)

GENERAL INFORMATION

INTRODUCTORY

The Air Force Reserve Officers Training Corps (Air Force ROTC) unit was established at the University in 1951 under authority of Section 40-47C, National Defense Act of June 3, 1916, as amended. Air Force personnel, approved by the President of the University, are assigned by the Department of the Air Force to supervise and conduct the Air Force ROTC program.

The mission of the Air Force ROTC is to develop in selected university students, through a permanent program of instruction, those qualities of leadership and other attributes essential to their progressive advancement to positions of increasing responsibility as commissioned officers in the United States Air Force. Classroom instruction and leadership training are provided to develop in the student the knowledge and the attributes of character, personality, and leadership required of commissioned officers.

COURSE OF STUDY

The course of study is divided into the basic course covering the first two years and the advanced course covering the junior year, summer training unit, and senior year.

The program takes into consideration the fact that many of the academic subjects in which college students are enrolled have a direct relationship to military as well as to civilian careers. Consequently, some of the liberal arts courses of the University have been substituted for academic courses included in standard Air Force ROTC curricula. Courses have been carefully selected to avoid duplication in instruction and to provide practical training in organization, leadership, and discipline, which will be of value in industrial or professional careers. The duties and responsibilities of commissioned officers, oral and written

* The President of the University, the Dean of Faculties, and the Director of the Division are members ex officio of this Board.
Selection Board is for the academic year 1959-60.

expression, and the techniques of problem solving are emphasized throughout the course, both in theory and practice.

Twenty semester hours of elective credit* are granted Air Science students, 3 hours a semester during the first three years and 1 hour a semester during the senior year. It should be noted that senior students receive full credit for the required six semester hours of University courses in the liberal arts. See "Department of Air Science" for a list of the subjects covered. In addition thereto, orientation flights and field trips to Air Force bases are available to selected cadets on a voluntary basis.

Cadets in the advanced course receive subsistence allowances from the Government totaling approximately \$500, which is exempt from income tax. During the period of summer training, cadets receive \$75 a month, food, lodging, and travel expense. Uniforms, textbooks, and training materials are provided for all Air Science courses at no expense to the cadet.

ELIGIBILITY REQUIREMENTS

Enrollment in the Division of Air Science basic course is open to all men students who are at least 14 years of age, physically fit, of good character, and candidates for a Bachelor's degree. Men students enrolling in the basic course are required to complete successfully the two-year course as a prerequisite to graduation from the University. Upon successful completion of the basic course, a cadet may apply for enrollment in the advanced course.

Women students may enroll in the Basic Leadership Laboratory course, which satisfies the physical education requirement. They may also enroll in the academic portion of the basic course for elective credit, with the approval of the Director of Air Science and the dean concerned.

A cadet enrolled in the advanced course must successfully complete the junior- and senior-year Air Science curricula and summer training unit as a prerequisite to graduation. Upon graduation he is obligated to accept a commission in the United States Air Force, if tendered. Any cadet who for academic, physical, or other reasons becomes disqualified for a commission is relieved of this obligation. Cadets enrolled in the course leading to pilot training may be required to pursue a 35-hour course of flying instruction during the senior year. This flying instruction is provided by a Civil Aeronautics Administration approved school at government expense, and leads to qualification for a private pilot's certificate.

Both men and women students may enroll in Advanced Air Science courses with the approval of the Director of Air Science and the dean concerned.

* The amount of elective credit applicable toward a degree varies with the curriculum concerned.

MILITARY SERVICE DELAY

Deferment from induction under the Selective Service Act of 1951 may be granted to selected cadets within authorized quotas. Normally, a cadet is not considered for draft deferment until he has completed one semester's work in the University, with a quality-point index of at least 2.00. A cadet's deferment is subject to withdrawal if his quality-point index falls below 2.00.

STUDENT HONORARY MILITARY SOCIETIES

The Arnold Air Society.—A national honorary military society of qualified Air Force ROTC cadets established to further the mission, traditions, and concept of the United States Air Force as a means of national defense, to promote American citizenship, and to create a close and more rewarding relationship among the Air Force ROTC cadets. The national organization founded in 1947, was named in honor of the late General of the Air Force Henry Harley Arnold. The local squadron established in 1952, was named in honor of General Carl Spaatz (retired), the first Chief of Staff of the United States Air Force. All Air Force ROTC cadets who meet the established qualifications are eligible for election to membership. Members are authorized to wear a blue and gold auguilette and ribbon on their cadet uniforms.

Pershing Rifles.—A national honorary military society founded in 1894 by Lieutenant (later General of the Armies) John Joseph Pershing. Its purpose is to encourage, preserve, and develop the highest ideals of the military profession, promote American citizenship, create a closer and more efficient relationship, and provide appropriate recognition of a high degree of cadet achievement. Only basic ROTC cadets are eligible for election to membership. Members are authorized to wear a blue and silver cord and ribbon on their cadet uniforms.

WOMEN'S ACTIVITIES

Flying Sponsors.—A local women's honorary organization established in 1952 to sponsor Air Force ROTC activities.

Angel Flight.—For women who wish to participate with the men in the Leadership Laboratory. Attractive uniforms are supplied free of charge.

REGULATIONS

Cadets and students in the Division of Air Science are subject to and are expected to familiarize themselves with the University regulations stated on pages 13-30 and 52-59; the regulations of the college, school, or division in which enrolled; and the regulations of the United States Air Force pertaining to Air Force ROTC cadets. Individual copies of Cadet Regulations are issued upon enrollment.

THE SUMMER SESSIONS

B. H. Jarman, *Dean* (to February 1, 1960); C. W. Cole, *Dean* (since February 1, 1960)

THE DEAN'S COUNCIL*

Wood Gray, I. B. Hansen

During the summer of 1960 the University offers an eight-week session for undergraduate and graduate students in the Arts and Sciences. The Law School offers work in two six-week sessions. The School of Education offers a special six-week session for teachers, with a pre-session of three weeks, post-session of three weeks, and a twelve-week evening session.

During the summer of 1960, courses are offered in the Junior College, Columbian College (the senior college), the Law School, the School of Pharmacy, the School of Education, the School of Government, and the College of General Studies.

For a complete statement concerning summer-term work, see the Summer Sessions catalogue.

* The Dean of Faculties and the Dean of the Summer Sessions are members ex officio of the Council.

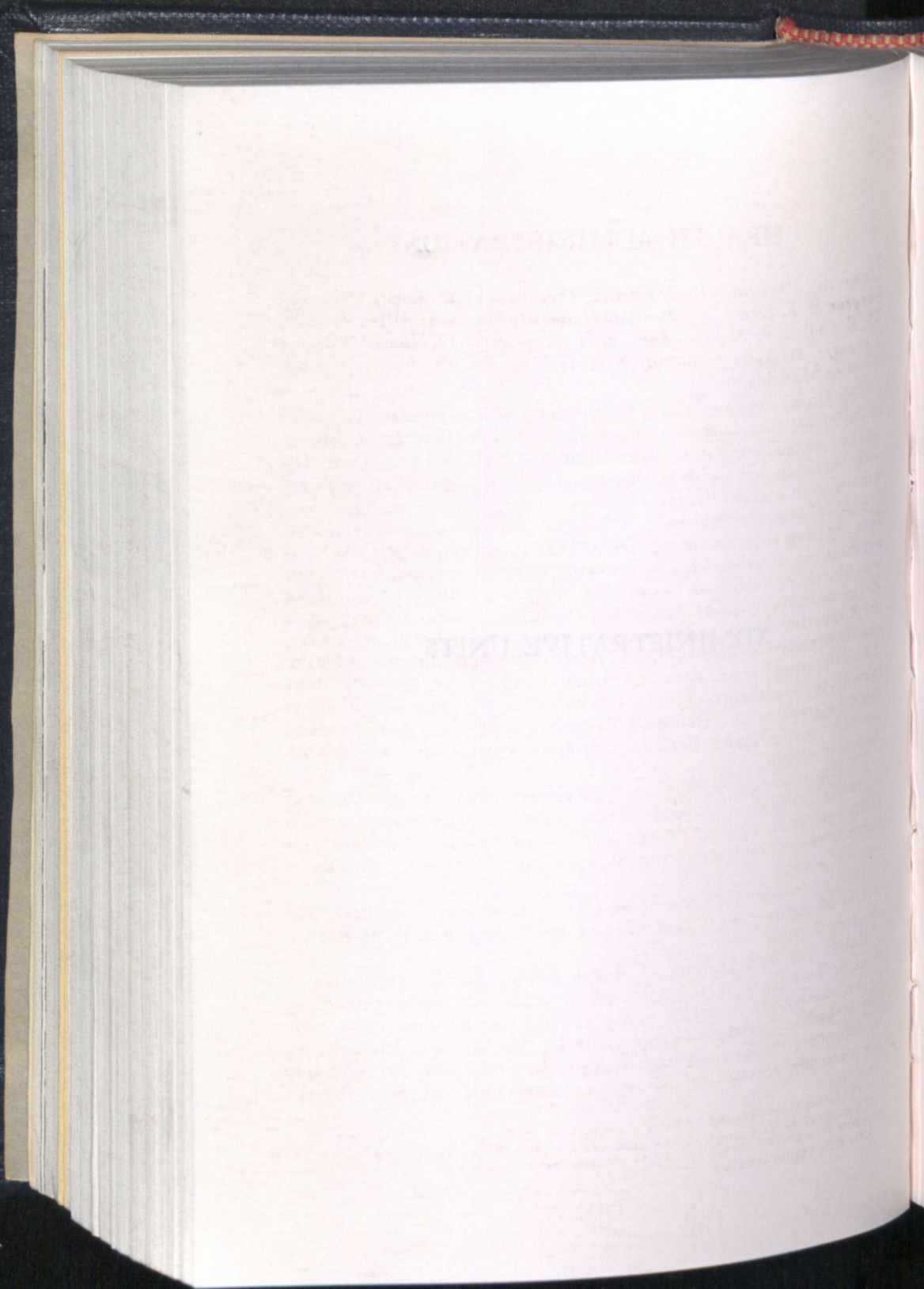
THE SUNDAY SCHOOL

The Sunday School is a place where the children of the church are taught the principles of the Christian religion. It is a place where they learn to love God and their neighbors, and where they are prepared to live the Christian life.

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ADMINISTRATIVE UNITS



HEALTH ADMINISTRATION*

University Physicians R. B. Castell (*Director*), H. L. Pugh; *University Surgeon* B. F. Dean, Jr.; *Associate University Physicians* Alfred Brigulio, M. E. Callan, R. A. Cox (*Eye*), R. H. Harmon, H. O. House (*Nose and Throat*); *Associate University Surgeon* J. B. Harrell; *Nurse-Secretary* Beatrice McBride

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school;† (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.‡ All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the

* The listing of Administrative Officers is for 1959-60.

† A charge of \$2 for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.

‡ See Rule (5) for exception.

University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

VETERANS EDUCATION

D. C. Faith, *Director*

The George Washington University is approved to provide training for eligible persons under the provisions of Public Laws 346, 16, 550, 894, and 634. The Office of Veterans Education, Building Q, 2029 H Street, NW., operates as a service bureau for such persons interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration.

Eligible persons are advised to consult this Office concerning the educational program of the University and the procedure for securing educational benefits before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D.C.

PUBLIC LAW 634

(War Orphans' Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

PUBLIC LAW 190

(World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1956, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

PUBLIC LAW 550

(Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950 and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Train-

ing, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

PUBLIC LAWS 16 AND 894

(Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to the Veterans Administration for approval of their training objectives at least sixty days prior to registration.

SERVICE SCHOOL CREDITS

A limited amount of credit earned in service schools since 1941 may be considered for assignment to qualified degree candidates in the Junior College, Columbian College, the School of Engineering, and the School of Government. Veterans should submit to the Director of Admissions photostatic copies of their service school records, indicating courses successfully completed with sufficient identification of the course to locate it in the Guide to Evaluation of Educational Experience in the Armed Forces.

COMMUNITY AND UNIVERSITY SERVICES

THE READING CLINIC

M. E. Coleman, *Director*

The Reading Clinic, 2018 I Street NW., offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition special reading improvement classes are conducted on the high school and adult level.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests as well as the various reading and spelling tests. Results are interpreted and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students and adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachistoscope, rate accelerator, and controlled reader are also used for increasing speed of comprehension.

Fees.—The fee for individual diagnosis is \$35; for individual instruction, \$4.50 a lesson; for semi-individual instruction, \$3.50 a lesson; for instruction in small groups with common reading difficulties, \$2.75 a lesson; for materials, \$4. All fees are payable in advance at the Office of the Cashier.

THE SPEECH CLINIC

C. W. Pettit, *Director*

The Speech Clinic, Lisner Auditorium, 730 Twenty-first Street NW., offers diagnostic and corrective work for children and adults with such speech difficulties as stuttering, lisping, cleft palate, cerebral palsy, aphasia, foreign accent, voice, and articulatory problems.

Fees.—There is no charge for the diagnosis. The fee for individual instruction is \$7 an hour; for group instruction, \$4 an hour. Fees are payable at the Office of the Cashier.

THE TESTING AND COUNSELING CENTER

E. R. Ritzman, *Director*

The Testing and Counseling Center, 718 Twenty-first Street NW., offers services which are available to students enrolled in the University, to high school students, and to adults of the community.

The services are designed to assist individuals in the evaluation of their educational and vocational potentialities and objectives, diagnose academic difficulties, provide educational and vocational literature and

information, and refer individuals to qualified agencies for assistance with problems not handled by the Center.

Fees.—Except for specialized testing, the fee covers testing and counseling based on the results of the tests. For students who are currently registered as degree candidates in the University and for students in the Division of Special students who are in the process of qualifying for degree candidacy, the fee is \$7.50; for students currently enrolled in the University but not as degree candidates, the fee is \$30; for graduates of The George Washington University, \$30; for community clients under twenty-one years of age, \$35; for community clients twenty-one or over, \$45. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Center.

COURSES OF INSTRUCTION

COURSE OF INSTRUCTION

COURSES OF INSTRUCTION

On the following pages of this CATALOGUE, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered by the University in the summer of 1960 and in the academic year 1960-61. The courses as here listed are subject to some slight change. The University reserves the right to withdraw any course announced.

HOURS OF INSTRUCTION

Courses of instruction are scheduled in the morning, afternoon, and evening. Evening classes are identical with daytime sections of corresponding courses, are taught by the same instructors, and carry the same amount of credit. By taking the evening and summer classes and extending the time of study beyond the customary four years, a student who is able to give only part of his time to college work may complete a regular curriculum and obtain a degree.

EXPLANATION OF COURSE NUMBERS

In the departments of the School of Medicine, first-year courses are numbered from 101 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and fourth-year courses, from 401 to 500. This includes courses open to both medical and nonmedical students. Courses limited to nonmedical students follow the numbering system used in "all other schools and colleges" (see below).

In the Law School, first-year courses are numbered from 100 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and graduate courses from 401 to 500.

In all other schools and colleges the following system of numbering is used:

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the officer of instruction, and when the completion of additional work has been certified by the officer of instruction.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the officer of instruction, to qualified seniors; they are not open to Junior College students or other undergraduates.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3-3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ACCOUNTING*

Professor R. D. Kennedy (Executive Officer); Professorial Lecturers Edwin Lewis, F. C. Brimacombe, J. L. Buckler, F. V. Demaret, Frank Higginbotham, C. A. McLaughlin, C. L. Simpson, L. W. Hamilton; Associate Professor F. C. Kurtz; Assistant Professors W. E. Benson, E. E. Pontius, Jr.; Lecturer J. P. Fitzpatrick; Associate R. A. Lucas

Associate in Arts (Junior College—Two-year vocational curriculum in Accounting).—For curriculum see page 75.

Bachelor of Arts and Master of Arts in Government with a major in Accounting (School of Government).—See pages 67-69, 74, 197-98, 183-84, and 185-87, 188.

FIRST GROUP

1-2 *Introductory Accounting* (3-3)

First half: fall—morning and evening; spring—morning and evening; summer 1960. *Second half:* fall—morning and evening; spring—morning and evening; summer 1960. *First half:* basic principles underlying accounting records used by single proprietorships and partnerships, preparation of the work sheet and financial statements. *Second half:* basic principles underlying accounting records used by corporations; introduction to cost accounting, analysis of financial statements, and valuation and amortization problems. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor.

3 *General Accounting* (3)

Not offered 1960-61. Study of accounting systems used by single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

* The Staff of Instruction here listed is for the academic year 1959-60.

SECOND GROUP

- 101 *Cost Accounting* (3) Pontius, Kurtz
Fall—morning and evening; summer 1960. Theory and purposes of industrial cost accounting; treatment of systems of cost control and determination; and analysis and interpretation of cost data. Prerequisite: Accounting 1-2.
- 102 *Advanced Cost Accounting* (3) Pontius
Spring—evening. Advanced cost accounting theory and problems with emphasis on development and analysis of standard costs, the use of cost data for managerial control, and distribution cost accounting. Prerequisite: Accounting 101 or permission of the instructor.
- 111 *Financial Statement Analysis* (3) Kennedy, Benson, Higginbotham
Fall—morning; spring—evening; summer 1960. Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1-2 or permission of the instructor.
- 115 *Survey in Accounting* (3) Fitzpatrick, Pontius
Fall—evening; spring—evening; summer 1960. Accounting systems used by single proprietorships and corporations with emphasis on methods of compiling, analyzing, classifying, and summarizing accounting data; and the use of accounting information in the management process. Not open for credit to Accounting or Business Administration majors.
- 121-22 *Intermediate Accounting* (3-3) Benson, Simpson
Academic year—morning and evening. *First half:* valuation and amortization problems of current assets, long-term investments, tangible fixed assets, intangible assets, and deferred charges; accounting for current, noncurrent, contingent, and estimated liabilities. Prerequisite to 121: Accounting 2 or permission of the instructor. *Second half:* accounting for the organization, financing, operation, and dissolution of corporations and partnerships; basic principles of consignment and installment sales. Prerequisite to 122: Accounting 121 or permission of the instructor.
- 132 *Accounting Theory* (3) Benson, Kurtz
Spring—morning; summer 1960. Development of basic accounting principles and concepts with special reference to current thought expressed by the American Institute of Certified Public Accountants and the American Accounting Association. Prerequisite: 6 hours of accounting.
- 141 *Governmental Accounting* (3) Lewis
Fall—evening. Problems relating to governmental appropriation accounts, encumbrances, and fund accounting. Emphasis on municipal and state government accounting with an introduction to federal accounting. Prerequisite: Accounting 1-2 or permission of the instructor.
- 144 *Accounting in the Federal Government* (3) Lewis
Spring—evening. Accounting procedures in the Federal Government, with emphasis on agency level accounts, implementation of accrued expenditure legislation, and accounting support for cost-based budgets. Accounts of the United States Treasury; current concepts of allotment, obligation, and disbursement accounting and reporting. Prerequisite: Accounting 141 or four semesters of accounting.

- 161 *Income Tax Accounting* (3) Kurtz, McLaughlin, Hamilton
Fall—morning and evening. Problems involved in the federal income taxation of individuals and corporations, differences between tax accounting and financial accounting, social security taxes. Prerequisite: Accounting 1-2.
- 162 *Federal Tax Practice* (3) Kurtz, McLaughlin, Hamilton
Spring—morning and evening. Advanced problems of federal tax practice such as the tax treatment of partnerships, estates, trusts, corporate reorganizations, foreign income, and gifts; use of the tax services; assessment, collection, and refund procedures. Prerequisite: Accounting 161 or the permission of the instructor.
- 171 *Auditing* (3) Pontius, Kurtz
Fall—evening; spring—morning. Duties and responsibilities of auditors; principles and procedures of making audits, techniques of verifying each financial statement item, preparation of audit working papers and reports. Prerequisite: Accounting 121-22.
- 172 *Auditing Practice* (3) Pontius
Spring—evening. Preparation of audit reports, accounting statements to be filed with Securities and Exchange Commission, and current developments of auditing standards and practice. Prerequisite: Accounting 171 or permission of the instructor.
- 181 *Accounting Systems* (3) Lewis
Fall—evening. Theory and procedure of designing and installing accounting systems, for collecting, recording, analyzing, and presenting accounting data. Prerequisite: Accounting 101, 121-22, and 171, or permission of the instructor.
- 191 *Advanced Accounting* (3) Higginbotham, Kurtz
Fall—evening; summer 1960. Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121-22.
- 193 *Business Budgeting* (3) Buckler
Fall—morning; spring—evening; summer 1960. Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1-2.
- 194 *Business Budgeting: Practice and Problems* (3) Lewis
Not offered 1960-61. Practical application of budget principles and techniques; advanced problems involved in general budgetary administration for management control purposes in commercial and industrial business. Prerequisite: Accounting 193 or permission of the instructor.
- 198 *Professional Accounting Review* (3) Lewis
Spring—evening. Review and coordination of the principles and techniques developed in the accounting curriculum, in preparation for general practice in the field of accountancy and for professional accounting examinations. Prerequisite: Accounting 101, 141, 162, 171, and 191, or permission of the instructor.

THIRD GROUP

- 211-12 *Managerial Accounting* (3-3) Kennedy, Brimacombe
First half: not offered 1960-61. Second half: spring—evening. First half: analysis of the accounting system with special reference to the use of financial

and operating records and accounting reports as tools of management; a study of valuation and amortization problems including the influence of price level changes on accounting data. Prerequisite: Accounting 1-2 or 3. *Second half:* a survey of internal accounting controls, commercial budgets, and cost accounting systems used by management in directing and controlling a business. Prerequisite to Accounting 212: Accounting 211 or permission of the instructor.

- 215 *Survey of Managerial Accounting* (3) Pontius
Not offered 1960-61. Nature, preparation, analysis, and interpretation of accounting reports; study of cost accounting, business budgeting, and internal accounting controls with emphasis on their use in the management process. Prerequisite: Accounting 1-2, 3, or 115.

- 231 *Contemporary Accounting Theory* (3)
Fall—evening. Advanced accounting principles and concepts and recent theories concerned with the valuation of assets and determination of income. Admission by permission of the instructor.

- 246 *Governmental Accounting and Budgeting Problems* (3)
Not offered 1960-61. Advanced principles and practices in federal accounting relationship to general policy and administration. Prerequisite: Accounting 144 or permission of the instructor.

- 275 *Internal Control and Auditing* (3) Kurtz
Summer 1960. Internal accounting controls; review and appraisal of accounting systems, procedures, and managerial policies with respect to their effectiveness and profitableness. Emphasis on the use of internal control and auditing as an aid to management. Prerequisite: Accounting 171 or permission of the instructor.

- 295-96 *Seminar in Accounting* (3-3) Kennedy
Academic year—evening. Selected accounting research topics and problems; individual oral and written reports. Admission by permission of the instructor.

- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1960.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the accounting courses listed below for students enrolled in the following special programs: Navy Graduate Comptrollership Program, Air Force Advanced Management Program, and Engineering Administration.

- 3 *General Accounting* (3)
115 *Survey in Accounting* (3)
204 *Survey of Cost Accounting* (2)
211-12 *Managerial Accounting* (3-3)
215 *Survey of Managerial Accounting* (3)
275 *Survey of Internal Control and Auditing* (2)
293 *Budget Preparation and Control* (3)

AIR SCIENCE*

Professor E. M. Wall (*Executive Officer*); Assistant Professors J. L. Gagnier, T. G. Martin, W. W. Richardson III; Instructors H. L. Frakes, G. C. Purcell, Anthony Nassner, A. O. Kevari

Commission in the United States Air Force Reserve.—Upon being awarded a Bachelor's degree and upon the satisfactory completion of the Air Force ROTC course of instruction prescribed by law and regulations, the graduate will be appointed Second Lieutenant, United States Air Force Reserve.

BASIC COURSE

- I-2 Leadership Laboratory—Freshman Year (I-1)** The Staff
Academic year—afternoon. Cadet basic airman training. Military courtesy, discipline, appearance and bearing; element, flight squadron, and mass formation drill; parades and ceremonies. Minimum 15 hours a semester. Laboratory fee, charged one time a year, \$3. (May be substituted for Physical Education I-2.)
- II-12 Leadership Laboratory—Sophomore Year (I-1)** The Staff
Academic year—afternoon. Cadet noncommissioned officer training. Military bearing and courtesy, all phases of drills and ceremonies, command voice training and command responsibility. Prerequisite: Air Science I-2, 21-22 for men and Air Science I-2 for women. Political Science I or 9 is recommended as an elective during the sophomore year in preparation for Political Science 171 (see Air Science 171). Minimum 15 hours a semester. Laboratory fee, charged one time a year, \$3. (May be substituted for Physical Education II-12.)
- 21 Air Science—Freshman Year (2)**
Fall: 2 hours a week—morning and afternoon. General survey of air power designed to provide the student with an understanding of the elements and potentials of air power. Fundamentals of air power; military air powers of the world, military research and development, air vehicle industries; air lines and airways; general aviation; elements of an aircraft; and aerodynamics.
- 22 Air Science—Freshman Year (2)**
Spring: 2 hours a week—morning and afternoon. General survey of air power to include, control, navigation and propulsion systems; space vehicles; military instruments of national security; and professional opportunities in the United States Air Force.
- 51 Air Science—Sophomore Year (2)** Martin
Fall: 2 hours a week—morning and afternoon. General survey of the roots and development of aerial warfare emphasizing the principles of war, concepts of employment of forces, and the impact of changing weapon systems. Treatment of aerial warfare is undertaken to include targets and weapons.
- 52 Air Science—Sophomore Year (2)** Martin
Spring: 2 hours a week—morning and afternoon. Treatment of aerial warfare is continued including aircraft and missiles, bases and facilities, and operations.

* The Staff of Instruction here listed is for the academic year 1959-60.

ADVANCED COURSE

- 101 *Air Science—Junior Year* (3) Gagnier
Fall: 4 hours a week—morning. Air force officer development. Knowledge and skills required of a junior officer in the Air Force. This includes staff organization and functions, communicating, instructing, and techniques of problem solving.
- 102 *Air Science—Junior Year* (3) Gagnier
Spring: 4 hours a week—morning. Air Force officer development. Principles and practices of leadership. This includes basic psychology of leadership, the military justice system, and application of the problem solving techniques and leadership theory to simulated and real Air Force problems.
- 103-4 *Leadership Laboratory—Junior Year* The Staff
(Credit is a part of Air Science 101 and 102)
Academic year—afternoon. Cadet noncommissioned officer and officer training. Wearing of the uniform, parades and ceremonies, commands and command voice. Cadets perform duties involving planning for and supervision of Cadet Corps activities. Emphasis placed on leadership and management proficiency. Minimum 15 hours a semester.
- 105 *Summer Training Unit—Between Junior and Senior Years* (required) The Staff
Attendance at a four-week Air Force ROTC summer training unit at an Air Force base within continental United States is mandatory. Program consists of familiarization flying, physical training, individual weapons, Air Force base activity and equipment, field exercises, air base problems, and leadership training.
- 151-52 *Air Science—Senior Year* (1-1) Wall
Academic year—morning. *First half:* weather and navigation. A study of the weather and navigational aspects of airmanship, such as temperature, pressure, air masses, precipitation, weather charts, and dead reckoning navigation. *Second half:* the Air Force officer. A study of materials to help the cadet make a rapid, effective adjustment to active duty as an officer of the United States Air Force. Prerequisite or concurrent registration: Political Science 171 and Geography 146, which are not to be taken in the same semester of the academic year.
- 153-54 *Leadership Laboratory—Senior Year* The Staff
(Credit is a part of Air Science 151-52)
Academic year—afternoon. Cadet officer training. Cadet officers conduct activities of Corps of Cadets through chain of command, instruct subordinates, plan and supervise Cadet Corps training and administration. Preparation for commissioned officer duties. Development of leadership and managerial responsibilities. Minimum 15 hours per semester.

ANATOMY*

Professors I. R. Telford† (*Executive Officer*), Paul Calabrisi, Robert Walmsley (*Visiting Research*); Professorial Lecturer T. D. Stewart;

* The Staff of Instruction here listed is for the academic year 1959-60.
† On sabbatical leave spring semester 1959-60.

Associate Professors F. D. Allan, T. N. Johnson; *Assistant Professor* J. B. Christensen; *Clinical Instructors* R. N. Brown, L. E. Church, L. C. Dearden

Special Lecturers W. E. Haymaker, J. V. Michalski

Master of Science in the field of Anatomy (Columbian College).—Prerequisite: a Bachelor of Arts or Bachelor of Science degree from this University, or the equivalent, with a major in Biology, Chemistry, or Zoology. The undergraduate program must include the following courses, or the equivalent: Chemistry 11-12, 21, 151-52; Physics 11, 12; Zoology 1-2, 41-42. Biochemistry 221-22 is recommended as an elective.

Required: the general requirements of Columbian College as stated on pages 88-91. The thirty semester hours of graduate work must include Anatomy 203, 204, 205, 221-22, 295-96, 299-300, and graduate courses in biochemistry, physiology, or related fields selected with the approval of the Department. It is not always possible to arrange courses and research so that the student can be assured of completing all the required work in one academic year.

Doctor of Philosophy (Graduate Council).—See page 98.

101-2 *Gross Anatomy*

Academic year: fall—12 hours a week; spring—8½ hours a week. Regional dissection of the human body, supplemented with lectures and quiz sections. Study of X-ray anatomy to emphasize the functional aspects of the position, shape, and relation of the viscera and skeletal components.

103 *Human Embryology*

Fall—3 hours a week. The origin and development of the human body. Special emphasis on the value of embryology in interpreting anatomical anomalies and variations as seen in gross dissection, surgery, obstetrics, and pathology.

104 *Neuroanatomy*

Spring—5½ hours a week. The macroscopic and microscopic study of the central nervous system and the special sense organs. Emphasis on such dynamic aspects as development, pathways, lesions, etc.

105 *Microscopic Anatomy*

Fall—9 hours a week. Study of the detailed minute structure of cells, tissues, and organs of the human body, with emphasis on the relation of structure to function. Recognition and interpretation of histological sections tested by practical examinations.

106 *Living Anatomy*

Spring—1 hour a week. An introduction to physical diagnosis, with special emphasis on topographical anatomy.

201-2 *Gross Anatomy (6-4)*

Academic year—as arranged. For qualified nonmedical graduate students. Same as Anatomy 101-2. Anatomy 201—laboratory fee \$21; Anatomy 202—laboratory fee, \$16.

203 *Human Embryology (2)*

Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 103. Laboratory fee, \$8.

- 204 *Neuroanatomy* (3) Johnson and Staff
Spring—as arranged. For qualified nonmedical graduate students. Same as Anatomy 104. Laboratory fee, \$13.
- 205 *Microscopic Anatomy* (4) Telford and Staff
Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 105. Laboratory fee, \$13.
- 221-22 *Seminar* (1-1) Allan and Staff
Academic year: 1 hour a week—as arranged. Research or reports and discussions of special topics by the Staff and graduate students. For graduate students. Medical students are encouraged to attend.
- 249-50 *Introduction to Medical Research** (3-3) The Staff
Academic year—Sat. 8:00 A.M. to 1:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.
- 295-96 *Research* (arr.) The Staff
Academic year—as arranged. Fees to be arranged.
- 299-300 *Thesis* (3-3) The Staff

ANESTHESIOLOGY†

Professor C. S. Coakley (*Executive Officer*); Clinical Professor D. H. Stubbs; Associate Professor Seymour Alpert; Assistant Professor C. R. MacCordy; Assistant Clinical Professors S. N. Albert, W. A. Weiss; Associate P. R. Kaiser; Clinical Instructors W. E. Bageant, Allen Widome, Charles Gruenwald, C. R. Bruce

- 320 *Anesthesiology* The Staff
Spring—1 hour a week. The fundamentals of anesthesia are reviewed and correlated with other medical specialties.
- 421-22 *Anesthesia Seminar* The Staff
Academic year—1 hour a week. Students attend anesthesia seminars during their surgical clinical clerkships. University Hospital.
- 433-34 *Advanced Anesthesiology* The Staff
Academic year—as arranged. Students are rotated through the work of the department for a period of two weeks and assigned to work in the operating rooms and to attend conferences and seminars. For the more advanced students a three-week elective is offered.

* This is an interdepartmental course. The student should register in the department directing his research.

† The Staff of Instruction here listed is for the academic year 1959-60.

ART*

Professor D. C. Kline (Executive Officer); Professorial Lecturers Grose Evans, Henri Dorra; Associate Professor L. P. Leite; Studio Lecturers on the staff of the Corcoran School of Art Edmund Archer, Richard Lahey, Jessalee Sickman, E. F. Walton, Heinz Warneke, Charles Forsythe, Eugene Guillet, Frank Huseman, Peter Masters, Joseph Tancy

Bachelor of Arts with a major in (1) Art History and Theory, (2) Drawing and Painting, (3) Sculpture, or (4) Commercial Art (Columbian College—Departmental):

The major in Art History and Theory.—Prerequisite: the Arts and Letters curriculum in the Junior College, or the equivalent, including Art 31-32 and 71-72, see page 69.

Required: in addition to the general requirements stated on pages 81-87, eighteen semester hours, as follows: Art 101, 102, 105, 109, 161-62; and twelve semester hours selected from Art 106, 107, 110, 141, 142, 151, or from third-group courses open to undergraduates with the approval of the instructor.

The major in Drawing and Painting, Sculpture, or Commercial Art.—Prerequisite: the Arts and Letters curriculum in the Junior College, or the equivalent, including Art 21-22, and 31-32 or 71-72.

Required: in addition to the general requirements stated on pages 81-87, twenty-four semester hours of studio practice; six semester hours of art history selected from second-group courses or from third-group courses open to undergraduates with the approval of the instructor.

Classes in the practice of art are held at the Corcoran School of Art. *Bachelor of Arts in Education with a teaching field in Art (School of Education).*—Prerequisite: the Education curriculum, page 72.

Required: the Art option, page 159, and professional courses on pages 166-67. *Master of Arts in the field of Art History and Criticism (Columbian College).*—Prerequisite: the degree of Bachelor of Arts with a major in Art History and Theory at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91. As much as possible of the twenty-four semester hours in course work should be in third-group courses. A general written examination on the problems in the field of Art History and Criticism; a written thesis embodying the results on some specific topic in the history and criticism of art.

Master of Arts in the field of Museology (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Art History and Theory at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91. Twelve semester hours in museum courses: Art 151, 252, 271, 272; twelve semester hours divided between courses in art history and courses in related fields outside the Department of Art; a general written examination in the field of museology; a written thesis embodying the results of research on some specific aspect of museums or museum work.

Master of Fine Arts in the field of Painting or of Sculpture (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Drawing and Painting, Sculpture, or Commercial Art at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91. As much as possible of the twenty-four semester hours in course work

* The Staff of Instruction here listed is for the academic year 1959-60.

should be in third-group courses. A creative thesis in painting or sculpture; a paper discussing some technical phase of the problem illustrated by the thesis.

Special Nondegree Program in Museum Training.—In collaboration with the museums of the Washington area, The George Washington University offers a two-year program for students wishing museum training but not interested in working for a Master's degree. The work of the program, which is under the direction of the Department of Art, is conducted almost entirely in museums, and includes Art 151, 252, 271, and 272. For detailed information, consult the Executive Officer of the Department of Art.

ART HISTORY AND THEORY

FIRST GROUP

- 1 *Art Appreciation* (3) The Staff
Fall—morning; summer 1960. A consideration of the vocabulary, methods, and materials of creative expression in the fine arts. A study of the language and function of art in its various media, the development of styles, aesthetic principles, theories, and ideals in art through the ages. (Not intended for the prospective art major.)
- 31-32 *Survey of Art* (3-3) Leite
1960-61 and alternate years: academic year—evening; 1961-62 and alternate years: academic year—morning. A survey of the arts in the Western World from prehistoric to modern times.
- 71-72 *Introduction to the Arts in America* (3-3) Kline
Academic year—evening; summer 1960. Painting, sculpture, architecture, furniture, and the popular arts from the colonial beginnings to the present.

SECOND GROUP

- 101 *Ancient Art* (3) Kline
Fall—morning. The development of the forms of architecture, sculpture, painting, and the minor arts in the Ancient civilizations of Egypt, Mesopotamia, Greece, and Rome.
- 102 *Medieval Art* (3) Kline
Spring—morning. A study of the architecture, sculpture, and painting from the formative stages of Christian Art in the Byzantine Age through the Romanesque and Gothic periods.
- 105 *Renaissance Art in Italy* (3) Leite
Fall—afternoon; summer 1960. The development of painting, sculpture, and architecture in the 15th and 16th centuries in Italy.
- 106 *Renaissance Art in the North* (3) Leite
Spring—afternoon. A study of the painting in the Netherlands, Germany, France, Spain, and Portugal.
- 107 *Eighteenth Century Art in Europe* (3)
Fall—evening. The development of painting, sculpture, and architecture in 18th century Europe.
- 109 *Nineteenth Century Art in Europe* (3) Leite
Fall—evening. The development of European painting and sculpture from Neoclassicism and Romanticism through Impressionism.

- 110 *Contemporary Art* (3) Leite
 Spring—evening. A study of sculpture and painting from Post Impressionism through the later modern movements to the present.
- 141 *Interior Decoration* (3) Kline
 1960-61 and alternate years: fall—afternoon. A study of the principles of decoration dealing with furniture designs and ensemble layout, draperies, color, accessories, and lighting.
- 142 *House Planning* (3) Kline
 1960-61 and alternate years: spring—afternoon. Study of the contemporary house for family living, including site problems, the case plan, materials of building, and climate conditioning.
- 143 *Folk Arts in America* (3) Kline
 Not offered 1960-61. Ceramics, woodcarving, ironwork, decorative painting, weaving, and other crafts; survey of American folk music.
- 151 *Principles of Museum Work* (3) Dorra
 Fall—evening. An introduction to the history and development of museums; a study of the problems of museum administration, connoisseurship, cataloguing, installation, conservation, and educational service. Open to graduate students by permission of the instructor. Field trips to galleries and museums, as arranged.
- 161-62 *Theory and Criticism* (3-3) Evans
 Academic year—evening. The artist on art and the history of art criticism.

THIRD GROUP

- 203 *Primitive Art** (3) Kline
 1960-61 and alternate years: fall—afternoon; 1961-62 and alternate years: fall—evening. The arts of prehistoric and primitive man in Europe in the pre-Columbian Americas, Oceania, and Africa.
- 204 *Art of the Far East** (3) Kline
 1960-61 and alternate years: spring—afternoon; 1961-62 and alternate years: spring—evening. The architecture, painting, and sculpture of China, Korea, and Japan.
- 205 *Baroque Art in Italy** (3) Leite
 Fall—afternoon. The development of painting, sculpture, and architecture in the 16th and 17th centuries in Italy.
- 206 *Baroque Art in the North** (3) Evans
 Spring—evening; summer 1960. The development of painting, sculpture, and architecture in the 16th and 17th centuries in Holland, Flanders, Spain, France, Germany, and England.
- 210 *Christian Iconography** (3) Leite
 1960-61 and alternate years: spring—afternoon. The origins and development of Christian symbols and themes from Early Christian to modern times.
- 243-44 *Seminar* (3-3) The Staff
 Academic year—as arranged. Special study and research in the artistic areas of Antiquity, the Middle Ages, the Renaissance, Baroque Art, the Modern era, the Orient, and America.

* May be taken for undergraduate credit with the approval of the instructor.

- 252 *Museum Techniques** (3) Dorra
 Spring—as arranged. The study and observation of actual work problems in the various departments of museums and galleries. All work to be conducted in museums. Prerequisite: Art 151.
- 271-72 *Museum Techniques** (arr.) Dorra
 Academic year—as arranged. Assignments in intern training in museum work. Students may take this course three days a week from 9:00 A.M. to 5:00 P.M. throughout the academic year and earn 3 credits a semester; or they may take it intensively, 5 days a week from 9:00 A.M. to 5:00 P.M., and earn 6 credits in one semester. Prerequisite: Art 151, 252.
- 289-90 *Thesis* (3-3) The Staff
 Academic year—as arranged.

DRAWING AND PAINTING, SCULPTURE,
 AND COMMERCIAL ART†

FIRST GROUP

- 21-22 *Basic Design†* (3-3) Forsythe
 Academic year—morning and evening; summer 1960—Art 21 (3). Practice of the basic principles of design; creative exercise in various media to acquire the control of two- and three-dimensional form.
- 45-46 *Drawing and Painting I—Life and Still Life* (6-6) Sickman
 Academic year—morning and afternoon.
- 65-66 *Drawing and Painting I—Life, Still Life, and Portrait* (3-3) The Staff
 Academic year—morning and afternoon; summer 1960—Art 65 (3).
- 67-68 *Drawing and Painting I—Life and Portrait* (6-6) Archer
 Academic year—morning, afternoon, and evening.
- 81-82 *Sculpture I* (6-6) Warneke
 Academic year—afternoon and evening.
- 83-84 *Fundamentals of Commercial Art* (3-3) Walton
 Academic year—afternoon.

SECOND GROUP

- 125-26 *Drawing and Painting II—Life, Still Life, and Portrait* (6-6) Sickman
 Academic year—morning and afternoon.
- 127-28 *Drawing and Painting II—Life and Portrait* (6-6) Archer
 Academic year—morning, afternoon, and evening.
- 165-66 *Drawing and Painting II—Life and Portrait* (6-6) Lahey
 Academic year—morning, afternoon, and evening; summer 1960—Art 165 (6)‡.

* Primarily for candidates for the degree of Master of Arts in the field of Museology and students in the Special Program in Museum Training.

† Art 21-22 is prerequisite to all other studio courses.

‡ May be taken for 3 credit hours with the approval of the instructor.

- 175-76 *Advanced Design* (6-6) Forsythe
Academic year—afternoon and evening.
- 179-80 *Sculpture II* (6-6) Warneke
Academic year—afternoon and evening. Portrait-life modeling and com-
position in clay, plaster and wood carving.
- 183-84 *Commercial Art* (6-6) Walton
Academic year—afternoon and evening. Perspective drawing; scaling;
drawing of furniture, merchandise, and fashion; lettering and typography;
layout; rendering techniques; production methods.
- 185-86 *Advanced Commercial Art* (6-6) Walton
Academic year—afternoon and evening. Layout and illustrative projects in
advertising campaigns; reproduction methods in black and white, half-tone
mediums, and color; work portfolios.

THIRD GROUP

- 265-66 *Painting III* (6-6) The Staff
Academic year—morning, afternoon, and evening; summer 1960—Art 265 (6)*.
- 275 *Painting IV* (6) The Staff
Fall—as arranged; spring—as arranged.
- 279-80 *Sculpture III* (6-6) Warneke
Academic year—afternoon and evening.
- 281 *Sculpture IV* (6) Warneke
Fall—as arranged; spring—as arranged.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged.

BACTERIOLOGY, HYGIENE, AND
PREVENTIVE MEDICINE†

Professors L. W. Parr (*Emeritus*), A. M. Griffin, H. L. Ley, Jr. (*Executive Officer*), M. L. Robbins; *Clinical Professor* R. G. Beachley; *Assistant Professors* W. G. McCarten, Rudolph Hugh; *Clinical Instructor* A. H. Traum; *Associates* W. D. Hann, G. B. Pelleu, Jr.

Special Lecturers S. J. Ajl, S. B. Brooks, R. C. Cook, C. W. Emmons, R. H. Felix, J. L. Goddard, F. B. Gordon, Leon Jacobs, M. C. Leikind, H. J. Magnuson, G. O. Pierce

Master of Arts or Master of Science in the field of Bacteriology (Columbian)

* May be taken for 3 credit hours with the approval of the instructor.

† The Staff of Instruction here listed is for the academic year 1959-60.

College).—Prerequisite: a Bachelor of Arts or a Bachelor of Science degree, respectively, from this University, or the equivalent, with a major in Biology, Botany, Chemistry, or Zoology. The undergraduate program must include the following courses or the equivalent: Chemistry 11-12, 21, 22, 151-52; Physics 11, 12; Zoology 1-2, 41-42.

Required: the general requirements of Columbian College as stated on pages 88-91. The thirty semester hours must include (if not presented for admission) Bacteriology 112, 210, 249-50, 293-94, 299-300 and Biochemistry 221-22. The remaining courses are to be selected from Bacteriology 209, 219-20, 230, 232, 234, 240 and 295-96. The student with much bacteriological background may substitute for credit one or more courses from the following: cytology, genetics, cell physiology, entomology, histology, biostatistics, and protozoology. It is not always possible to arrange courses and research so that the student can be assured of completing all required work in one academic year.

Doctor of Philosophy (Graduate Council).—See page 98.

101 Biostatistics (1)

Griffin

Fall—Sat., 11:00 A.M. The meaning and use of statistical terms and methods pertinent to the design of experiments and the interpretation of the results obtained in laboratory, clinical, and field trials.

112 General Bacteriology (4)

Hugh

Spring—Mon., Wed., and Fri., 9:10 to 12:00 A.M. For nonmedical students. A study of the fundamentals of bacteriology, including hygienic applications. Methods of cultivation and control of several groups of microorganisms are studied in the laboratory. Prerequisite: any biological laboratory science; Chemistry 11-12. Laboratory fee, \$13.

209 Medical Microbiology (1 to 11)

Ley and Staff

Fall: lecture (4 hours), laboratory (10 hours)—as arranged. Bacteria, rickettsia, viruses, yeasts, molds, protozoa, and metazoa which relate to the health and diseases of man—cultural study of most important forms; methods of diagnosis by microscopic, cultural, immunologic, and animal reactions; theory and methods of immunology; vaccines; serums; antibiotics. Open to suitably prepared graduate students; may be elected as a whole or in part by adding the appropriate letter to the course number, with credit allocated as follows: (a) *Bacteriology*, including rickettsia and viruses—lecture (4), laboratory (3); (b) *Parasitology*, including medical mycology—lecture (2), laboratory (1); (c) *Immunology* (1). May be taken by a limited number of candidates for Master's degrees. Laboratory fee, \$4.50 for each semester hour of laboratory work.

210 Fundamentals of Epidemiology and Preventive Medicine (2)

Ley and Staff

Spring—Mon., 2:00 to 4:00 P.M. Sources, modes, and implications of infection and injury. Consideration also given the problem of accidents and industrial medicine. Open to liberal arts graduate students. Prerequisite: Bacteriology 112 or 209.

219-20 Advanced Microbiology (arr.)

Hugh and Staff

Academic year—as arranged. Special study of advanced methods and current problems in microbiology for suitably qualified students specializing in microbiology. Prerequisite: Bacteriology 112 or 209; Chemistry 151-52 or the equivalent; permission of the instructor. Laboratory fee, \$4.50 a semester hour.

- 230 *Statistics in Microbiology* (3) Griffin
Spring—as arranged. The application of statistical methods to the problems of microbiology. For graduate students. Prerequisite: elementary college algebra.
- 232 *Immunological Methods* (3) McCarten
1960-61 and alternate years spring—as arranged. Preparation and testing of serological materials. Demonstration of basic serological phenomena. For graduate students. Prerequisite: Bacteriology 112 or 209 and permission of the instructor. Laboratory fee, \$11.
- 234 *Virology* (6) Robbins
1961-62 and alternate years: spring—as arranged. Study of viruses and rickettsiae. Lectures and laboratory exercises. For graduate students. Prerequisite: Bacteriology 112 or 209 and permission of the instructor. Laboratory fee, \$16.
- 240 *Advanced Epidemiology and Public Health* (3) Ley
Spring—as arranged. Conferences, readings, and problems for graduate students dealing with specialized and advanced phases of the topics presented in Bacteriology 210. Prerequisite: Bacteriology 210.
- 249-50 *Introduction to Medical Research** (3-3) The Staff
Academic year—Sat., 8:00 A.M. to 1:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.
- 293-94 *Staff Seminar* (1-1) The Staff
Academic year—as arranged. For graduate students. Bi-weekly throughout the year.
- 295-96 *Research in Bacteriology* (arr.) The Staff
Academic year—as arranged.
- 299-300 *Thesis* (3-3) The Staff
- 401 *Public Health Practice* Beachley and Staff
Fall—1 hour a week for 5 weeks. Study of public health practice at national, state, city, and county levels. Public and private agencies.

BIOCHEMISTRY†

Professors J. H. Roe (Emeritus), C. R. Treadwell (Executive Officer);
Professorial Lecturers W. R. Carroll, G. G. Ashwell, Irving Gray;
Associate Professor B. W. Smith; Associate Professorial Lecturer Leon
Swell; Assistant Professors G. V. Vahouny, J. M. Bailey; Associate
H. W. Clark, Jr.

* This is an interdepartmental course. The student should register in the department directing his research.

† The Staff of Instruction here listed is for the academic year 1959-60.

Master of Arts or Master of Science in the field of Biochemistry (Columbian College).—Prerequisite: a Bachelor of Arts or a Bachelor of Science degree. The undergraduate program must have included the following courses, or the equivalent: Chemistry 11-12, 21, 22, 151-52; Physics 11 and 12; Zoology 1-2 or Biology 1-2.

Required: the general requirements of Columbian College as stated on pages 88-91. The thirty semester hours must include Biochemistry 221-22, 225-26, 227-28, 299-300. The remaining courses are to be selected from Biochemistry 224, 232, 241, 251, 261, 295-96, or, with the approval of the adviser, from graduate courses in Bacteriology, Chemistry, Physiology, or Pharmacology. It is usually not possible to arrange courses and research so that the student can be assured of completing all of the required work in one academic year.

Doctor of Philosophy (Graduate Council).—See page 98.

113-14 *Biochemistry* The Staff

Academic year: lecture (2 hours), conference (1 hour), laboratory (6 hours)
—as arranged. Physiological and clinical chemistry. For medical students.

221-22 *Biochemistry (4-4)* Treadwell, Vahouny

Academic year—Tues. and Thurs., 9:00 to 12:00 A.M. and 1:00 to 2:00 P.M.
A lecture and laboratory course for nonmedical students. Prerequisite: Chemistry 22 and 152. Material fee, \$15 a semester.

224 *Biochemistry of the Enzymes (1)* Ashwell

Spring—Mon., 5:00 P.M. Lecture course dealing with the biochemistry of the enzymes and enzyme reactions. Prerequisite: Biochemistry 113 or 221.

225-26 *Biochemical Procedures (3-3)* Smith and Staff

Academic year—as arranged. A laboratory course. Material fee, \$16 a semester.

227-28 *Biochemistry Seminar (1-1)* The Staff

Academic year—Fri., 4:00 P.M. The current literature in the field of biochemistry, mainly for graduate students, but open to a limited number of specially qualified medical students.

232 *Proteins and Amino Acids (1)* Carroll

Spring—Wed., 5:00 P.M. A lecture course. Prerequisite: Biochemistry 113 or 221.

241 *Isotopes (2)* Gray

Fall—Sat., 9:00 A.M. Theoretical characterization of isotopes and their applications in biology. Attention will be given to counting, health physics and radiation safety, autoradiography and chromatography.

249-50 *Introduction to Medical Research* (3-3)* The Staff

Academic year—Sat., 8:00 A.M. to 1:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

251 *Carbohydrate Metabolism (1)* Roe

1960-61 and alternate years: Fall—Sat., 9:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

* This is an interdepartmental course. The student should register in the department directing his research.

- 261 *Biochemistry of the Lipids* (1)
1961-62 and alternate years. Fall—Sat., 9:00 A.M.
requisite: Biochemistry 114 or 222.
- 295-96 *Research in Biochemistry* (arr.)
Academic year—as arranged.
- 299-300 *Thesis* (3-3)

Swell, Treadwell
A lecture course. Pre-

The Staff

The Staff

BIOLOGY*

Professor P. W. Bowman (*Executive Officer*), *Professorial Lecturer*
R. C. Cook; *Associate Professor* S. C. Munson; *Associate Professorial*
Lecturer Ntinos Myrianthopoulos

Bachelor of Arts or *Bachelor of Science* with a major in *Biology* (*Columbian College—Field-of-Study*).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in Junior College, see pages 69 and 70.

Required: the general requirements of *Columbian College* as stated on pages 81-87 and the grade of "pass" on the *Biology* major examination during the senior year. The coordinated field of knowledge upon which the student will be examined includes the classification and life histories of plants and animals, ecology, geology, evolution, heredity, the physical and cultural development of man, public health problems, and the history of biology. The course offerings will be correlated and supplemented by supervised study in a proseminar. For further details, see the pamphlet, which is available at the Office of the Dean of *Columbian College*.

Master of Arts or *Master of Science* in the field of *Biology* (*Columbian College*).—Prerequisite: A *Bachelor of Arts* or *Bachelor of Science* degree, respectively, with a major in *Biology* at this University, or the equivalent.

Required: the general requirements of *Columbian College* as stated on pages 88-91.

Bachelor of Arts in Education with a teaching field in *Biology* (*School of Education*).—Prerequisite: the *Education* curriculum, page 72.

Required: the *Biology* option, page 159, and the professional courses listed on pages 166-67.

Doctor of Philosophy (*Graduate Council*).—See page 98.

FIRST GROUP

1-2 *Survey in Biology* (3-3)

Academic year—morning, afternoon, and evening; summer 1960. Systematic study of the plant and animal kingdoms, with emphasis upon the interdependence of living things and their relations with their environments. Introduction to evolution, heredity, public health, and conservation. Material fee, \$7 a semester. Lecture, laboratory, and field trip to nearby countryside, museums, and other places of biological interest.

Munson and Staff

SECOND GROUP

107-8 *Organic Evolution* (3-3)

1960-61 and alternate years: academic year—morning; 1961-62 and alternate

Bowman

* See also departments of Botany and Zoology.

The Staff of Instruction here listed is for the academic year 1959-60.

years—evening. A study of the theories of organic evolution and present ideas on the principal lines of development in the plant and animal kingdoms; a review of the contributions to an understanding of the mechanisms involved in this process from the fields of genetics and cytology. Prerequisite: one year of college work in biology, botany, or zoology.

115-16 Cytology (3-3)

Bowman

Lecture and laboratory. 1960-61 and alternate years: academic year—evening; 1961-62 and alternate years: academic year—afternoon. Plant and animal cells and their components, including the chromosomes and their role in heredity, with training in the preparation of materials for study. Prerequisite: one year of college work in biology, botany, or zoology. Material fee, \$8 a semester.

127 Genetics (3)

Fall—evening. A lecture course in which the general principles are illustrated with specific examples of inheritance in plants and animals, including man. Prerequisite: one year of college work in biology, botany, or zoology.

139 Cell Physiology (3)

Not offered 1960-61. The fundamental physiology of protoplasm. Prerequisite: Chemistry 12 and one year of college biology, botany, or zoology.

199-200 Proseminar in Biology (3-3)

Munson

Academic year—as arranged. Individually planned and directed study by means of which majors in biology may correlate and supplement the subject matter presented in various regular courses.

THIRD GROUP

201-2 Seminar: Cytology (3-3)

Bowman

Academic year—evening.

211-12 Research in Cytology (arr.)

Bowman

Academic year—as arranged; summer 1960.

299-300 Thesis (3-3)

Bowman

Academic year—as arranged; summer 1960.

BOTANY*

Professor R. B. Stevens (*Executive Officer*); Professorial Lecturer L. B. Smith; Associate Professorial Lecturers K. F. Parker, C. L. Adams, R. S. Sigafos; Lecturers Edward Hacsaylo, H. M. Cathey, G. A. Livingston

Bachelor of Arts or Bachelor of Science with a major in Botany (Columbian College—Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, including Botany 1-2, see pages 69 and 70.

* See also the departments of Biology, Geography, and Zoology.
The Staff of Instruction here listed is for the academic year 1959-60.

Required: in addition to the general requirements of Columbian College as stated on pages 81-87, a minimum of twenty-four semester hours of second-group courses in Botany or in a combination of Botany and related sciences as approved by the Executive Officer.

Master of Arts or Master of Science in the field of Botany (Columbian College).—Prerequisite: the equivalent of a Bachelor of Arts or Bachelor of Science degree, respectively, from this University with a major in Botany or Biology.

Required: the general requirements of Columbian College as stated on pages 88-91.

Doctor of Philosophy (Graduate Council).—See page 99.

FIRST GROUP

1-2 General Botany (3-3)

Lecture (2 hours), laboratory (2 hours). Academic year—morning, afternoon, evening; summer 1960. Study of the structure, activities, and development of the flowering plant; a survey of the different kinds of plants, their evolution, ecological relationships, economic significance, and principles of inheritance. Material fee, \$7 a semester.

The Staff

SECOND GROUP

105 Field Botany (3)

Lecture (1 hour), laboratory and field (4 hours). 1961 and alternate summers. A course, primarily for nonspecialists, emphasizing local flora. Prerequisite: Botany 1 or Biology 1, or permission of the instructor.

Parker

107 Plant Morphology: Lower Groups (3)

Lecture (1 hour), laboratory and field (4 hours). 1961-62 and alternate years: spring—evening. Field and laboratory study of the habitat, structure, and identification of representative algae, mosses, and ferns. Prerequisite: Botany 1-2 or Biology 1-2.

Adams

109 Plant Morphology: Seed Plants (3)

Lecture (2 hours), laboratory (2 hours). 1961-62 and alternate years: fall—evening. Comparative study of root, stem, leaf, and flower of seed plants, with special reference to economically important families. Prerequisite: Botany 1-2 or Biology 1-2. Material fee, \$8.

Adams

116 Plant Growth (3)

Lecture (2 hours), laboratory (2 hours). 1960 and alternate summers. A course, primarily for nonspecialists, emphasizing practical problems of growing and caring for plants. Prerequisite: Botany 1 or Biology 1, or permission of the instructor. Material fee, \$8.

Hacskaylo

118 Physiology of Bacteria and Fungi (3)

Lecture (2 hours), laboratory (2 hours). 1960-61 and alternate years: spring—evening. Lectures, literature reviews, and laboratory studies of the physiology of bacteria and fungi. Prerequisite: Botany 131 or permission of the instructor. Material fee, \$8.

Hacskaylo

125-26 Plant Taxonomy (3-3)

Lecture (1 hour), laboratory and field (4 hours). 1961-62 and alternate years: academic year—evening. A study of the characteristics, phylogeny, and classification of flowering plants. Field collection and identification. Prerequisite: Botany 1-2 or Biology 1-2.

Parker

- ¹³¹ *Mycology* (3) Stevens
Lecture (2 hours), laboratory (2 hours). 1960-61 and alternate years: fall—
evening. Prerequisite: Botany 1-2 or Biology 1-2. Material fee, \$8.
- ¹³³⁻³⁴ *Plant Pathology* (3-3) Stevens
Lecture (2 hours), laboratory (2 hours). 1961-62 and alternate years: aca-
demic year—evening. Prerequisite: Botany 1-2 or Biology 1-2. Material
fee, \$8 a semester.
- ¹³⁵⁻³⁶ *Plant Physiology* (3-3) Cathey
Lecture (2 hours), laboratory (2 hours). 1960-61 and alternate years: aca-
demic year—evening. Prerequisite: Botany 1-2 or Biology 1-2, and Chem-
istry 11-12. Material fee, \$8 a semester.
- ¹⁴¹⁻⁴² *Plant Ecology* (3-3) Sigafoos
Lecture (1 hour), laboratory and field (4 hours). 1960-61 and alternate
years: academic year—evening. Prerequisite: Botany 1-2 or Biology 1-2.
- ¹⁴³ *Introduction to Plant Geography* (3)
Not offered 1960-61.
- ¹⁴⁴ *The Vegetation of North America* (3)
Not offered 1960-61.

THIRD GROUP

- ²²¹⁻²² *Seminar: Taxonomy* (3-3) Smith
1962-63 and every fourth year: academic year—as arranged.
- ²³¹⁻³² *Seminar: Mycology and Plant Pathology* (3-3) Stevens
1960-61 and every fourth year: academic year—as arranged.
- ²³⁵⁻³⁶ *Seminar: Plant Physiology* (3-3) Cathey, Hacskeylo
1963-64 and every fourth year: academic year—as arranged.
- ²⁴¹⁻⁴² *Seminar: Plant Ecology* (3-3) Sigafoos
1961-62 and every fourth year: academic year—as arranged.
- ²⁹⁵⁻⁹⁶ *Research* (arr.) The Staff
Academic year—as arranged; summer 1959—Botany 295 (arr.). Fee to be
arranged.
- ²⁹⁹⁻³⁰⁰ *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1960.

BUSINESS AND PUBLIC ADMINISTRATION*

Professors R. N. Owens, H. G. Sutton, A. R. Johnson, J. L. Jessup,
J. C. Dockeray (*Executive Officer*), D. S. Brown, A. M. Woodruff,
G. C. Jacobus (*Research*), F. H. Gibbs; *Professorial Lecturers* M. E.
Ogdon, K. E. Stromsem, J. L. Krieger, C. W. Clewlow, W. G. Torpey,
J. N. Stonesifer, K. F. McClure, F. I. Shaffner, C. E. Houston, Charles
Berns, R. B. Eastin, I. S. Schwartz, Edward McCrensky; *Associate*

* The Staff of Instruction here listed is for the academic year 1959-60.

Professors John Clayton, Leonard Prestwich, Waldo Sommers; *Associate Professorial Lecturers* J. P. Murphy, W. W. Edwards, Robert Kaye, L. C. Collins, John Provan; *Assistant Professor* R. F. Towson, Jr.; *Lecturers* R. J. Bond, F. W. Walther, George Idelson, J. A. Morrow, W. D. Neighbors, J. F. Doubleday

Bachelor of Arts in Government with a major in Business Administration (School of Government).—For curricula, see pages 74, 182–83.

Master of Business Administration (School of Government).—Prerequisite: an acceptable undergraduate major in Business Administration or the equivalent.

Required: the general requirements for the degree as stated on pages 185, 191–92. (For requirements of Hospital Administration Master's field, see pages 192–93).

Master of Arts in Public Administration (School of Government).—For curricula see pages 189–91.

Master of Arts in Personnel Administration (School of Government).—For curriculum see page 191.

Doctor of Business Administration (School of Government).—Prerequisite: a Master's degree in Business Administration or a related field, or the equivalent, and proficiency in Statistics and Accounting to the satisfaction of the Committee on Doctoral Studies.

Required: thirty hours of graduate work beyond the Master's level, the passing of a general examination in six fields, and the writing and defending of a dissertation. See pages 193–94.

Bachelor of Arts in Education with teaching fields in Business Education (School of Education).—Prerequisite: the Education curriculum, page 72.

Required: the Business Education option, pages 160–61, and the professional courses listed on pages 166–67.

BUSINESS ADMINISTRATION

SECOND GROUP

101 *Business Organization and Combination* (3)

Fall—morning and evening; spring—morning; summer 1960.

Clayton
Simple and interrelated forms of business enterprise and their control by government.

102 *Fundamentals of Management* (3)

Fall—morning; spring—morning and evening; summer 1960.

Towson
Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking.

105 *Personnel Management* (3)

Fall—morning; spring—evening; summer 1960.

Owens, Towson
Industrial personnel and manpower programs, organizations and policy in personnel activities.

106 *Problems in Personnel Management* (3)

Spring—evening. Principles of manpower management illustrated by cases drawn from business, industry, and government. Prerequisite: Business Administration 105.

Owens, Stonesifer

107 *Labor-Management Contracts* (3)

Spring—morning; summer 1960.

Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations.

Sommers

- 109 *Office Management* (3) Walther
Fall—evening; spring—evening. Organization and layout of an office, use of office machines and appliances, planning and execution of work, supervision problems.
- 113 *Real Estate* (3) Doubleday
Fall—evening. Fundamentals of real estate practice; leasing and property management; valuation, financing, and taxation.
- 121 *General Insurance* (3) Doubleday
Spring—evening. A general course in underlying principles of property, life, marine, and casualty insurance, and the function of insurance in the economic life of a business or individual.
- 123-24 *Property and Casualty Insurance A and B* (2-2) Neighbors
1960-61 and alternate years: academic year—evening. The principles and practices of property and casualty insurance with emphasis on the economics of insurance, types of carriers, contract provisions, agency and brokerage, and state regulation and supervision.
- 125-26 *Property and Casualty Insurance C and D* Neighbors
(2-2)
1961-62 and alternate years. The principles and practices of property and casualty insurance with emphasis on theory of probability, rates and rating, reserves, financial statements, and investments; loss adjustment and loss prevention. Prerequisite: Business Administration 123-24.
- 127-28 *Property and Casualty Insurance E and F* Neighbors
(2-2)
1961-62 and alternate years. Principles of accounting; principles of business and personal finance; business organization and agency management.
- 129-30 *Property and Casualty Insurance G and H* Neighbors
(2-2)
1960-61 and alternate years: academic year—evening. Insurance law with particular attention given to construction of insurance contracts, and general commercial law as it relates to contracts, agencies, partnerships, corporations, personal property, real estate and mortgages, negotiable instruments, bankruptcy, bailments, common and private carriers, and negligence.
- 131 *Business Finance* (3) Clayton, Towson
Fall—morning; spring—morning and evening. Basic principles involved in the financing of business enterprises. Prerequisite: Accounting 1-2.
- 136 *Credit Management* (3)
Spring—evening. Types and sources of credit information, credit relationships from the standpoint of the commercial bank and the commercial business enterprise. Prerequisite: Accounting 1-2.
- 138 *Investments* (3) Dockeray, Shaffner
Spring—evening; summer 1960. Analysis of factors of investment credit with application to different types of investments, proper selection of investments for various classes of investors, regulation. Prerequisite: Accounting 1-2.
- 141 *Principles of Marketing* (3) Prestwich, Towson
Fall—morning; spring—evening; summer 1960. An introduction to marketing structure and its relation to the total economy, consumer and demand anal-

ysis, retailing, wholesaling, major marketing management problems and policies.
Prerequisite: Economics 1-2.

- 142 *Marketing Management Problems* (3) Prestwich
Spring—morning. Practical problems of retailers, wholesalers, and manufacturers considered through the use of cases and text material; fundamental considerations in marketing decisions and the nature of the problem-solving process. Prerequisite: Business Administration 141.
- 143 *Marketing Research* (3) Towson
Fall—evening. Principles and practices of marketing research with particular emphasis upon basic methods and techniques, sources and interpretation of data, and presentation of results.
- 145 *Sales Management* (3) Towson
Spring—morning. Organization of the sales department, sales planning and forecasting, quotas, territories, performance standards, and analysis and control of distribution costs. Prerequisite: Business Administration 141.
- 147 *Advertising* (3) Idelson
Fall—evening. Advertising as a function of marketing and merchandising; uses and limitations of advertising as a tool of management; fundamentals involved in getting a finished advertisement before potential customers; evaluation, criticism, and control of advertising.
- 149 *Retail Advertising and Sales Promotion* (3) Prestwich
Not offered 1960-61. Operation of the advertising department in a retail store. Use of newspaper, radio, and television advertising by retail stores. Other advertising media, programming, and budgeting.
- 150 *Procurement and Materials Management* (3) Prestwich
Spring—morning. Purchasing organization, procedures, and policies; market relationships; selection of merchandise and sources of supply; procurement information and records; evaluation of procurement practices in industry and government.
- 151 *Retail Store Management* (3) Prestwich
Fall—evening. Principles and problems in retail store management including financing, location, personnel management, store layout, buying, pricing, stock control, accounting, sales promotion, and customer services.
- 152 *Retail Merchandising and Control* (3) Prestwich
Not offered 1960-61. Managerial problems and policies with reference to profit calculations, pricing, purchase planning, stock control, merchandise and expense budgets, inventory evaluation, and other related phases of retail merchandising. Prerequisite: Business Administration 151 or Accounting 1-2.
- 153 *Principles of Personal Selling* (3) Prestwich
Fall—morning; summer 1960. Basic principles that underlie personal selling and the practical application of these principles. Emphasis is given to the human factor. Career opportunities and the role of selling in our economy are also considered.
- 158 *Traffic Management* (3) Kaye
Spring—evening. Organization and records of traffic department, routing of shipments, services by carriers, rates and charges, relation of shipper to transportation agencies.

- 161 *Commercial Law: Contracts, Sales, Agency, and Bailments* (3) Berns, Collins, McClure
Fall—morning, afternoon, and evening.
- 162 *Commercial Law: Negotiable Instruments, Property, Mortgages* (3) Berns, Collins, Murphy
Spring—morning, afternoon, and evening.
- 163 *Law in Relation to the Form of Business Units: Corporations, Partnerships, and Trusts* (3) Murphy
Fall—evening.
- 171 *Principles of Transportation* (3) Clayton
Fall—evening. Impact of transport on society; development, economic characteristics, services, rates, and regulation of the various modes of domestic inter-city transportation.
- 172 *Public Utilities* (3) Clayton
Not offered 1960-61. Legal and economic meaning of the public utility concept; development, services, economic characteristics, ratemaking, and regulation of the various utility industries, with particular emphasis on electric, gas, telephone, and urban transit industries.
- 173 *Commercial Motor Transportation* (3) Clayton
Fall—evening. Organization, management, services, economic characteristics, rates, and regulation of motor transport firms; highways and highway financing considered from the point of view of both producers and users of the services.
- 174 *Commercial Air Transportation* (3) Clayton
Spring—evening. Organization, management, services, economic characteristics, rates, and regulation of air transport firms; policies and activities of the government in the development, promotion, and control of air transport.
- 175 *Introduction to Foreign Trade* (3) Kaye
Fall—evening. Terminology, trade usages and practices, conditions essential to successful trading, economic bases of international trade, obstacles to trade, tariffs, impact of governmental controls on private trade. Prerequisite: Economics 1-2.
- 176 *Exporting and Importing* (3) Kaye
Not offered 1960-61. Policy and operating problems of foreign trade, financing, documentation, packing and transportation of shipments, ocean marine insurance, and U. S. Customs procedure and formalities.
- 178 *Foreign Markets* (3) Ogdon
Spring—evening. Pattern of world trade by countries and commodities, methods of preparing market surveys, selected regional market analyses. Prerequisite: Economics 1-2.
- 191 *Business Reports and Analyses* (3)
Not offered 1960-61. Sources of management information, array and analysis of data, interpretation and presentation of the findings.
- 193 *Management Communication* (3) Morrow
Fall—evening. A survey course in the problems of communication; written communication: style and format; oral communication: oral briefing and pres-

- entation; group leadership; rapid reading; completed staff work; and related subjects.
- 195 *Controllershship* (3) Edwards
Fall—evening. The duties, responsibilities, and place of the controller in a business organization; relations of controller to other departments and regulatory bodies; and the controller's relation to price setting and inventories, depreciation policies, internal auditing, expense control and budgeting; and financial reports to management, stockholders, and employees. Prerequisite: Accounting 1-2. Open to seniors.
- 197 *Introduction to Business Policy* (3) Towson
Fall—morning. Significance of business policies in management; formulation of policies; relation of various organizational levels to policy making; some significant policies, including case problems.
- 198 *Case Problems in Management* (3) Towson, Prestwich
Fall—morning and evening; spring—morning and evening. Principles and techniques of management illustrated by cases drawn from business and industry. Prerequisite: Business Administration 102, 105, 131, 141.

THIRD GROUP

- 201 *Advanced Management* (3) Towson
Fall—evening. An advanced course in management emphasizing principles of management in relation to business enterprise.
- 209 *Seminar in Personnel Management* (3) Stonesifer
Fall—evening. Discussion of industrial personnel and manpower management, and research in advanced problems.
- 210 *The Personnel Manager* Jessup
Spring—evening. The job of the personnel manager and his place in the organization; relations of the personnel manager to other executives; the personnel manager's policy role, and his relations with the chief executive. Key problems of the senior personnel executive.
- 218 *Data Processing* (3) Provan
Spring—evening. Selecting and adapting data processing equipment, characteristics of leading systems, elements of programming.
- 231 *Corporate Financial Problems* (3) Dockeray, Houston
Fall—evening. Financial practice in promotion, consolidation, and mergers; capital structure adjustments; and reorganization.
- 232 *Seminar in Business Finance* (3) Dockeray, Houston
Spring—evening; summer of 1960. Research in advanced financial problems.
- 237 *Security Analysis* (3) Dockeray, Shaffner
Fall—evening. An advanced course in the applications of investment principles and analytical techniques to the selection of investments. Prerequisite: Business Administration 138.
- 238 *Seminar in Investments* (3) Dockeray, Shaffner
Not offered 1960-61. Research in investment problems, techniques of selection and the management of various types of funds. Prerequisite: Business Administration 138.

- 241-42 *Seminar in Marketing* (3-3) Johnson
Academic year—evening. An advanced course in marketing, emphasizing special and current problems in the field. (Business Administration 241 is not a prerequisite for Business Administration 242.)
- 251 *Seminar in Retail Management* (3) Prestwich
Not offered 1960-61. Research in retailing practices, with emphasis on trends, new developments, and current problems.
- 268 *Management Engineering* (3) Clewlow
Fall—evening. Analysis of the techniques for initiation and implementation of management engineering programs, with emphasis on organization and methods surveys, including the study of work measurements, work simplification, management audits, and other management improvement programs.
- 273-74 *Readings in Business* (3-3) The Staff
Academic year—as arranged. Advanced readings in the fields of finance, marketing, and personnel management. Admission by permission of the instructor.
- 278 *The Dynamics of Business* (3) Clayton
Summer 1960. An analysis of the structure of American business, including a study of trend and cyclical change in economic activity and their bearing upon governmental policy.
- 286 *Management in the Armed Forces* (3) Jessup
Fall—evening. Special problems of military organization and management; applicability of business management techniques to the armed forces.
- 287 *Relation of Government to Business* (3) Clayton
Spring—evening. Activities of government in their relation to business management in such areas as labor relations, wages, production, and prices.
- 288 *Executive Leadership* (3) Krieger
Spring—evening. Examination of principles and problems of executive leadership and development; intensive consideration of basic issues and guides to executive action in business and public administration; review of the literature, significant research findings, and practical illustrations.
- 291-92 *Seminar in Business Management* (3-3) Owens
Academic year—evening; summer 1960—Business Administration 291 (3).
Research on various phases of management as practiced in American industry.
- 293-94 *Business Research* (3-3) The Staff
Not offered 1960-61.
- 296 *Seminar in Controllershship* (3) Edwards
Spring—evening. Research on advanced problems of the controller in all types of business organization and the Federal Government.
- 297-98 *Business Policy* (3-3) Jessup
Academic year—evening. Problems of management are analyzed with the view of developing a practical solution; cases are used to show the problems of personnel in marketing, industrial management, finance, etc.
- 299-300 *Thesis* (3-3) Dockeray and Staff
Academic year—evening; summer 1960.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following business administration courses for students enrolled in the following special programs: Navy Graduate Comptrollership Program, Air Force Advanced Management Program, and Engineering Administration.

- 191 *Business Reports and Analyses* (3) (Summer 1960)
- 235 *Financial Management* (3)
- 250 *Contract Administration* (3)
- 253 *Procurement and Distribution* (3)
- 261 *Seminar in Advanced Management* (3)
- 263-64 *Business Organization and Management* (3-3)
- 268 *Management Engineering* (3) (Summer 1960)
- 269 *Readings and Conferences in Controllershship* (2 or 3) (Summer 1960)
- 275-76 *Human Relations in Business* (3-3) (Summer 1960—
Business Administration 275 (3))
- 284 *Readings and Conferences in Management* (2)
- 290 *Research Seminar in Management* (3)
- 295 *Research Seminar in Controllershship* (3)

HOSPITAL ADMINISTRATION

THIRD GROUP

- 202 *Introduction to Hospital Administration* (3) Gibbs
Fall—evening. A survey of the organizations and activities involved in the maintenance of community health with emphasis on the role which hospitals play.
- 203 *Hospital Administration I* (3) Gibbs
Fall—evening; spring—evening. The special characteristics of formal organization in hospitals.
- 204 *Hospital Administration II* (3) Gibbs
Spring—evening. Problems of organization procedure with emphasis on ethics, philosophy, and informal relations in hospitals.
- 205 *Studies in Hospital Management I* (3) Gibbs
Fall—evening. An analysis of the functional problems of the hospital to include economics of hospital care, accounting, budgeting, purchasing, dietetics management, hospital maintenance and construction, safety, and institutional sanitation.
- 206 *Studies in Hospital Management II* (3) Gibbs
Spring—evening. Hospital personnel, the patient, and specialized groups; hospital law, education, training, and research.
- 207 *Hospital Management Methods* (3) Jacobus
Spring—evening. A study of the types of information available to management in hospitals; its collection, analysis, and use. One or more management projects must be completed by each student.

208 *Residency Year*

Not offered 1960-61. Twelve months of training in a hospital under the general supervision of the University, accompanied by a research report.

PUBLIC ADMINISTRATION

THIRD GROUP

- 210 *The Management Function* (3) Eastin
Spring—evening. Principles and processes of management with particular attention to planning of organization, direction and coordination of work, internal communication, and measurement of achievement in government.

- 211 *Problems of Governmental Organization* (3) ———
Fall—evening. Theories and principles of organization; analysis of problem areas in administration, such as decentralization, staff-line, field-headquarters, and executive-legislative relationships.

- 212 *Case Studies in Administration* (3) ———
Spring—evening; summer 1960. Analysis and discussion of problems in public management, approached by the group using primarily the case method.

- 213 *Administration in Government* (3) Brown
Fall—evening; spring—evening. Selected topics in problems of federal administration, with particular attention to the role of Congress and the public in the administrative processes.

- 215 *Seminar in Comparative Administration Systems* (3) ———
Fall—evening. Examination and analysis of the administrative systems of the major foreign governments with particular attention to practices applicable to administration in the United States.

- 216 *Management Analysis and Methods Improvement* (3) Clewlow
Spring—evening. Management engineering, techniques of organization survey and work analysis, improvement of administrative effectiveness, application of principles of scientific management.

- 217 *New Tools of Management* (3) Brown
Spring—evening. This course provides information for the advanced student on latest developments in new methods of administration, including electronics devices (automotive equipment), operations research, quality control, attitude measurement, and similar activities.

- 221-22 *Staff Functions in Government* (3-3) ———, Sommers

- Academic year—evening. Designed primarily to provide an understanding of the nature, use, and problems of the staff functions as tools of management. Survey of such staff areas as personnel, budgeting, controllership, procurement, property management, the agency lawyer, security, public relations and information, planning, research, the secretariat, management engineering, auditing, accounting, and administrative services.

- 225-26 *Internship in the Administrative Processes* (3-3) Sommers
Academic year—as arranged. This course is open only to persons selected by government agencies for participation in approved intern programs.

- 231 *Public Personnel Management* (3) Torpey
Fall—evening; summer 1960. Basic principles; structure and organization of personnel offices; responsibilities; inter-agency relationships; personnel staffing, training, and work measurement.
- 232 *Personnel Procedures and Problems* (3) Torpey
Spring—evening. Study of such personnel functions as recruitment, selection, placement, promotion, supervision, evaluation, classification, and training. Practical problems of personnel administration.
- 233 *Seminar in Manpower Development and Utilization* (3) Sommers
Fall—evening. Research projects and case studies in ways and means of increasing employee potential, use of training programs, executive development, incentive systems.
- 237 *Intermediate Management and Supervision* (3) Eastin
Fall—evening. The role of the supervisor and intermediate manager, methods for improving group performance, work measurement, pertinent regulations governing federal personnel.
- 241 *Human Relations in Governmental Administration* (3) McCrensky
Fall—evening. Factors involved in working with people in governmental institutions. Study and research in human problems in management; discussion of programs for improved human relationships.
- 251 *Governmental Budgeting* (3) Schwartz
Fall—evening; spring—evening; summer 1960. The role of budgeting in management; the principles and practices of budgetary formulation and administration.
- 252 *Seminar in Planning and Programming* (3) Jacobus
Fall—evening. Performance budgeting; relating the work program to the fiscal program; budgetary evaluation. This course is primarily for students who have completed Public Administration 251.
- 254 *Controllership in the Federal Services* (3) Krieger
Spring—evening. Function of the controller in federal agencies; special problems analyzed; comparison of the controller function in government and business.
- 259 *Government Procurement and Property Management* (3)
Not offered 1960-61. Principles and problems of government procurement; accounting and inventory; storage; development of specifications; property management.
- 260 *Seminar in Policy Formulation and Administration* (3) Brown
Fall—evening. Development and administration of agency goals and objectives, influence of individuals upon them; factors involving informal organization such as internal pressure groups, use of sanctions, and role of executive in furthering administrative policy.
- 261 *Public Opinion and the Administrator* (3) Stromsem
Fall—evening. Theories, techniques, and methods of working with the public; the use of interest groups in developing governmental programs; evaluating

public relations programs; the importance of timing; use of public opinion measurement techniques.

262 *Contemporary Administrative Theory and Practice* Jacobus
(3)

Spring—evening. Current theories and trends in management with particular attention to the behavioral sciences, communications, and applicability of research.

271 *Reading and Conference Course in Public Management and Administration* (3) Brown

Not offered 1960-61. The purpose of this course is to provide advanced students with directed reading in specific areas of public management and administration.

272 *Reading and Conference Course in Public Personnel Administration* (3) The Staff

Spring—as arranged. The purpose of this course is to provide advanced students with directed reading in specific areas of public personnel administration.

297 *Seminar in Public Administration* (3) Brown and Staff

Summer 1960. Advanced research on various phases of public administration including methods of policy formulation and control, the application of systems to management, administration problems of bureaucratic relationships.

299-300 *Thesis* (3-3) Brown and Staff

Academic year—evening; summer 1960.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following public administration courses for students enrolled in the Air Force Advanced Management Program and in Engineering Administration.

213 *Administration in Government* (3)

251 *Governmental Budgeting* (3) (Summer 1960)

CHEMISTRY*

Professors B. D. VanEvera, S. N. Wrenn, C. R. Naeser (*Executive Officer*), R. C. Vincent, W. F. Sager, R. E. Wood; *Associate Professors* J. W. Harkness, T. P. Perros, W. E. Schmidt, D. G. White†; *Assistant Professor* N. C. Hollbach; *Instructor* M. Ethier; *Lecturer* M. W. McPherson

Registration.—Before completing registration each student must obtain from the representative of the Department an assignment to lecture, recitation, and laboratory sections.

* The Staff of Instruction here listed is for the academic year 1959-60.
† On sabbatical leave spring semester 1959-60.

Bachelor of Arts or Bachelor of Science with a major in Chemistry (Columbian College—Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, see pages 69 and 70. The following first-group courses must be included: Chemistry 11-12, 21, and 22; Mathematics 29 and 30; Physics 11, 12, 13, 16; or 11, 14, 15, and 16.

Required: the general requirements of Columbian College, as stated on pages 81-87, including the following second-group courses: Chemistry 134 (or 231-32), 111-12, 113-14, 122, 151-52, and 135 or 155 (two semester hours), and a grade of "pass" on the chemistry major examination at the end of the senior year. The following correlated knowledge upon which the student will be examined includes the following fields: (1) analytical chemistry, (2) inorganic chemistry, (3) organic chemistry, (4) physical chemistry. The work of the junior and senior years must be approved by the Department. The German language is required of all majors who wish to be certified to the American Chemical Society. Others may elect French or Russian. Two foreign languages are recommended for students planning to do graduate work.

Master of Arts or Master of Science in the field of Chemistry (Columbian College).—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Chemistry from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91. All prospective Master's candidates must take qualifying examinations in the fields of analytical, inorganic, organic, and physical chemistry. These examinations will be given during the first week of classes each semester, and are a part of the prerequisites for all advanced courses. Deficiencies, if any, shall be eliminated by assignment to appropriate courses in the 100 group for which a limited amount of graduate credit may be assigned. The thirty hours of required work must include Chemistry 213 and at least one three semester hour course in the 200 group in two of the three fields of analytical, inorganic, and organic chemistry. In addition, the thirty hours must include at least four semester hours of laboratory work, Chemistry 193 and Chemistry 299-300. A reading knowledge examination in French or German (German preferred) must be passed before the second half of the work is started.

Doctor of Philosophy (Graduate Council).—See page 97.

Bachelor of Science in Engineering with an option in Chemistry (School of Engineering).—See pages 132-34 and 136-37. The Chemistry courses required for this degree are the same as those required for the Bachelor of Science degree with the major in Chemistry as itemized above.

Bachelor of Arts in Education with a teaching field in Chemistry (School of Education).—Prerequisite: the Education curriculum, page 72.

Required: the Chemistry option, page 161; and the professional courses listed on pages 166-67.

FIRST GROUP

3-4 Fundamentals of Physical Science (4-4)

A year course: credit is not given for the first half until the second half is completed. Academic year: lecture (3 hours)—morning, laboratory (3 hours)—afternoon. Introduction to methods and achievements of physical science, covering selected topics in chemistry, physics, astronomy, and geology. For nonscience majors. Laboratory fee, \$11 a semester.

Schmidt

11-12 General Chemistry (4-4)

A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). First half: fall—morning, afternoon, and evening; spring—morning, afternoon,

The Staff

and evening; summer 1960. *Second half*: fall—afternoon and evening; spring—morning, afternoon, and evening; summer 1960. Elementary course in general chemistry. Prerequisite: one year of high school algebra. Laboratory fee, \$18 a semester.

- 21 *Qualitative Inorganic Analysis* (4) Vincent
Lecture (2 hours), laboratory (6 hours). Fall—afternoon and evening; spring—afternoon and evening; summer 1960. Theoretical and practical study of methods of separating and identifying the more common cations and anions using semi-micro techniques. Prerequisite: Chemistry 12. Laboratory fee, \$18.
- 22 *Quantitative Inorganic Analysis I* (4) Schmidt
Spring: lecture (2 hours)—morning and evening; laboratory (6 hours)—morning, afternoon, and evening. Summer 1960. Theory and practice of quantitative analysis by typical volumetric and gravimetric procedures. Prerequisite: Chemistry 21. Laboratory fee, \$18.

SECOND GROUP

- 11-12 *Physical Chemistry Lectures* (3-3) Wood
A year course: credit is not given for the first half until the second half is completed. Academic year—morning and evening. Introduction to physical chemistry. Students registering for Chemistry 111-12 must register concurrently for Chemistry 113-14 unless they already have adequate credit for physical chemistry laboratory. Prerequisite: either (1) Chemistry 22 and 152, Mathematics 30, Physics 8; or (2) Chemistry 21, Mathematics 30, Physics 14 and 55.

- 13-14 *Physical Chemistry Laboratory* (2-2) Wood
A year course: credit is not given for the first half until the second half is completed. Academic year—afternoon and Saturday (morning and afternoon). Laboratory to accompany Chemistry 111-12. Students registering for Chemistry 113-14 must register concurrently for Chemistry 111-12 unless they already have credit for lectures in physical chemistry. Laboratory fee, \$18 a semester.

- 122 *Quantitative Inorganic Analysis II* (4) Schmidt
Fall: lecture (2 hours)—afternoon and evening; laboratory (6 hours)—morning and evening. Continuation of Chemistry 22 including theory and practice of separations, organic reagents, electrochemistry, and colorimetry in analysis. Prerequisite: Chemistry 22. Laboratory fee, \$18.

- 134 *Descriptive Inorganic Chemistry* (3) White
Spring—morning. An intermediate level course emphasizing the descriptive chemistry of the elements. Prerequisite: Chemistry 22, 151.

- 135-36 *Inorganic Chemistry: Preparations* (2-2) Perros
First half: fall—morning; spring—evening. *Second half*: spring—evening. Application of the technique of inorganic chemistry to the preparation and purification of a list of selected substances. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 122. Laboratory fee, \$18 a semester.

- 151-52 *Organic Chemistry* (4-4) Wrenn, Sager
A year course: credit is not given for the first half until the second half is completed. First half: fall—lecture (3 hours), morning and evening; laboratory (3

- hours), afternoon and evening; summer 1960. *Second half*: spring—lecture (2 hours), morning and evening; laboratory (6 hours), afternoon and evening; summer 1960. Chemistry of the compounds of carbon. Prerequisite*: Chemistry 21. Laboratory fee: Chemistry 151, \$11; Chemistry 152, \$18.
- 155 *Organic Chemistry: Preparations* (2 or 3) Wrenn
Spring—evening. Synthesis of organic compounds and application of the technique of organic chemistry to the preparation of pure compounds, using larger amounts and greater refinements than in Chemistry 151-52. Prerequisite: Chemistry 22 and 152. Laboratory fee, \$10.50 a semester hour.
- 156 *Qualitative Organic Analysis* (3)
Fall: lecture (1 hour), laboratory (6 hours)—evening. Identification of pure organic compounds, separation of mixtures, and identification of their components. Required of all students planning thesis work in Organic Chemistry. Prerequisite: Chemistry 22 and 152. Laboratory fee, \$18.
- 191 *History of Chemistry* (2) Perros
1961-62 and alternate years. Historical development of chemistry. Prerequisite: Chemistry 22 and 152.
- 193 *Chemical Literature* (1) Wrenn
Fall—evening. A general course in chemical literature with reference work and reports. Prerequisite: Chemistry 22 and 152. Prerequisite or concurrent registration: Chemistry 111-12 and 113-14.

THIRD GROUP†

- 203 *Chemical Kinetics* (2) Wood
1961-62 and alternate years. The rates of chemical reactions and the factors influencing them. Prerequisite: Chemistry 112.
- 211-12 *Physical Chemistry* (2-1) Wood
Academic year—morning and evening. Same course as 111-12. Chemistry 211-12 may be taken for credit only by special permission. Credit will be assigned only upon the satisfactory completion of Chemistry 213.
- 213 *Chemical Thermodynamics* (3) Wood
Fall—evening. Application of thermodynamics to chemical problems. Thermochemistry, homogeneous and heterogeneous equilibria, statistical calculation of thermodynamic properties, electrochemistry. Prerequisite: grade of A or B in Chemistry 111-12, Satisfactory in 211-12, or qualifying grade in physical chemistry qualifying examination.
- 216 *Statistical Mechanics* (3) Sager
1960-61 and alternate years: fall—evening. An introduction to classical and quantum statistics designed to acquaint the student with the basic principles and application of the method. Prerequisite or concurrent registration: Chemistry 213, or permission of instructor.
- 221-22 *Advanced Analytical Chemistry* (2 or 3-2 or 3) Schmidt
Lecture (2 hours), laboratory (3 hours—optional). *First half*: fall—evening. *Second half*: not offered 1960-61. Theory and application of recent methods of analysis including electrical and optical instrumentation. Prerequisite: Chemistry 213, or permission of instructor.

* This prerequisite may be waived in the case of the student who has earned a grade of C or better in Chemistry 12 within the past two years.

† The appropriate qualifying examination is prerequisite to all advanced courses.

istry 22 and 122. The lectures may be taken for 2 credits a semester without laboratory work; either half may be taken first. Laboratory fee, \$11 a semester.

- 231-32 *Special Topics in Inorganic Chemistry: the Chemistry of the Less Familiar Elements* (2-2) White, Perros

Academic year—evening. A series of one-semester courses covering such topics as (1) chemistry of the less familiar elements; (2) organometallic, organosilicon, and carbonyl compounds; and (3) co-ordination chemistry. Prerequisite: Chemistry 235.

- 233-34 *Radiochemistry* (2-2) Hollbach
1961-62 and alternate years. The preparation, properties, and uses of radioactive isotopes, both natural and artificial. Prerequisite: Chemistry 235-36.

- 235-36 *Inorganic Chemistry* (3-2) Naeser
Academic year—evening. Application of modern chemical theories to inorganic substances and reactions, followed by a detailed study, developed from the periodic table, of the chemistry of the more common elements. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111-12 and 113-14.

- 251-52 *Advanced Organic Chemistry* (3-3) Sager
Academic year—evening. Syntheses, reactions, and properties of carbon compounds; fundamental theories of organic chemistry. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111-12, 113-14.

- 253 *Advanced Synthetic Organic Chemistry* (3) Wrenn
Spring—evening. Study of reactions employed in the synthesis of organic compounds. Prerequisite: Chemistry 251.

- 257 *Theoretical Organic Chemistry* (3) Sager
1961-62 and alternate years. Survey of modern theories of organic chemistry with emphasis on reaction mechanisms. Prerequisite: Chemistry 252.

- 291-92 *Seminars: Recent Developments in Chemistry* (1-1) The Staff
Academic year—late afternoon.

- 295-96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1960. Research on problems approved by the Staff. Open to qualified students with advanced training. Laboratory fee, \$7.50 a semester hour.

- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1960. Laboratory fee, \$18 a semester.

CIVIL ENGINEERING*

Professors C. H. Walther, M. A. Mason, R. A. Hechtman (*Executive Officer*); Associate Professors G. M. Arkilic, R. R. Fox; Assistant Professor R. A. Hemmes; Lecturer R. E. Moffat

* The Staff of Instruction here listed is for the academic year 1959-60.

Bachelor of Civil Engineering (School of Engineering).—See pages 132-35 for statement of requirements.

Master of Science in Engineering (School of Engineering).—See pages 139-40 for statement of requirements.

Doctor of Science (School of Engineering).—See pages 142-44 for statement of requirements.

FIRST GROUP

21 *Rigid Body Mechanics I (3)*

Fall—morning and evening; spring—evening. Fundamental laws of Newtonian mechanics; equilibrium of a particle and a system of particles; beams, cables, trusses, and friction; plane kinematics. Prerequisite: Mathematics 31, Physics 14. The Staff

24 *Strength of Materials (3)*

Fall—evening; spring—morning and evening. Elementary principles of mechanics of deformable bodies; elastic and inelastic behavior, concept of stress and strain in two and three dimensions, strain energy and its application; analysis of axial loading, pure bending, torsion, combined loading, buckling, stress concentration, and fatigue. Prerequisite: Civil Engineering 21, Mathematics 31. The Staff

SECOND GROUP

112 *Surveying (3)*

Spring: lecture (2 hours), field work (2 hours)—Saturday. Plane surveying, including measurements, simple curves, and topographical surveying; space measurements; treatment of observational errors; earthwork computations; field astronomy. Prerequisite: Mathematics 31, Mechanical Engineering 10. Survey fee, \$13. The Staff

121 *Rigid Body Mechanics II (3)*

Fall—morning and evening; spring—evening. General force systems, equilibrium of a rigid body, generalized coordinates and constraints, work and potential energy, kinetic energy and angular momentum, dynamics of a particle and rigid bodies in space, impulsive motion. Prerequisite: Civil Engineering 21, Mathematics 111. The Staff

125 *Engineering Materials (4)*

Fall: lecture—morning and evening; laboratory—afternoon and evening. Mechanical and surface properties of engineering solids; relationships between the structure of a material and its mechanical and physical behavior; principles of the control of the properties of metals and nonmetallic solids. Prerequisite: Chemistry 12, Civil Engineering 24, Physics 16. Laboratory fee, \$11. Fox

128 *Soil Mechanics (3)*

1960-61 and alternate years: spring—afternoon; 1961-62 and alternate years: spring—evening. Mechanical properties of soils; theory and applications of lateral earth pressure, bearing capacity, and settlement of foundations. Prerequisite: Civil Engineering 125, 137, 144. Murdaugh, Dedrick

132 *Fluid Mechanics (3)*

Spring: lecture—morning and evening; laboratory—afternoon and evening. Development of the fundamental principles of flow of viscous and ideal compressible and incompressible fluids; dimensional analysis and model theory; laboratory work emphasizes principles, analysis of tests, and systematic observations of phenomena. Prerequisite: Civil Engineering 121, Mathematics 111. Mason and Staff

- 135 *Hydraulic Engineering* (3) Fox
1960-61 and alternate years: spring—afternoon; 1961-62 and alternate years: spring—evening. Applied fluid mechanics; pipe and open-channel flow; dams, spillways, and reservoirs; hydroelectric development; drainage and irrigation; control of river flow and floods; water supply and sewerage. Prerequisite: Civil Engineering 137.
- 137 *Applied Earth Sciences* (3) Fox
1960-61 and alternate years: fall—afternoon; 1961-62 and alternate years: fall—evening. Structural geology of rock and soil formations, seismology, climatology, ground water and river flow, hydrology, erosion and sedimentation, conservation. Prerequisite: Chemistry 12, Civil Engineering 125, 132.
- 143-44 *Structural Theory I-II* (4-4) Hechtman, Walther
1960-61 and alternate years: academic year—afternoon; 1961-62 and alternate years—evening. Theory and structural behavior of statically determinate and indeterminate beams, frames, trusses, and arches, and the application of basic principles to their analysis; structural laboratory including structural model analysis. Prerequisite or concurrent registration: Civil Engineering 125. Laboratory fee, \$11 a semester.
- 145 *Metal Structures* (3) Fox, Walther
1960-61 and alternate years: spring—evening; 1961-62 and alternate years: spring—afternoon. Application of structural theory to the analysis and design of metal structures under static and moving loads. Prerequisite: Civil Engineering 144, 157.
- 146 *Reinforced Concrete* (3) Fox, Walther
1960-61 and alternate years: fall—evening; 1961-62 and alternate years: fall—afternoon. Theory and design of plain and reinforced concrete structures. Prerequisite: Civil Engineering 144. Prerequisite or concurrent registration: Civil Engineering 157.
- 154 *Structural Dynamics* (3) Arkilic
1960-61 and alternate years: spring—afternoon; 1961-62 and alternate years: spring—late afternoon. Single degree of freedom systems, energy methods of finding natural frequencies, transient and forced vibration of structures. Prerequisite: Civil Engineering 144, Mathematics 111.
- 157 *Mechanics of Deformable Bodies* (3) Arkilic, Hechtman
1960-61 and alternate years: fall—afternoon; 1961-62 and alternate years: fall—late afternoon. An introduction to the advanced mechanics of deformable bodies including the theories of elasticity in cartesian and polar coordinates, plasticity of perfectly plastic solids, plates, and elastic stability. Prerequisite: Civil Engineering 125, Mathematics 112. Prerequisite or concurrent registration: Civil Engineering 144 or Mechanical Engineering 123.
- 165 *Engineering Planning and Organization* (3) Fox, Hechtman
1960-61 and alternate years: fall—late afternoon; 1961-62 and alternate years: fall—afternoon. Planning, organization, administration, and economics of engineering programs and projects. Prerequisite: senior standing.
- 168 *Regional and Urban Planning* (3) Hechtman
1960-61 and alternate years: spring—late afternoon; 1961-62 and alternate years: spring—afternoon. Introduction to regional and urban planning with emphasis on requirements for transportation systems. Prerequisite: Civil Engineering 165.

- 195-96 *Problems in Civil Engineering* (arr.)
 Academic year—as arranged. Special problems approved by the Staff. Pre-requisite: senior standing.

The Staff

THIRD GROUP

- 224 *Theory of Plates and Shells* (3) Arkilic
 1960-61 and alternate years: spring—evening. Classical and modern theories of plates and shells, plates and cylindrical shells under different loadings and boundary conditions, equations for plates including shear, rotationally symmetric shells under small deformations and their applications.
- 226 *Plasticity of Solids* (3) Hechtman
 1961-62 and alternate years: fall—evening. Plastic flow and fracture of solids; theory of elastic perfectly plastic solids, including basic concepts, limit analysis of beams, rigid frames, and plane stress problems; theory of fracture.
- 234 *Geotechnics in Soil Mechanics* (3) Fox
 1960-61 and alternate years: fall—evening. Dynamic geology in the formation and properties of soils; Boussinesq and Westergaard equations for stresses and deformations in soil masses; analysis of settlement; flow of water in soils; solutions of Laplace-type equations for seepage involving foundations, earth dams, and wells; theory of frost action.
- 235 *Theoretical Soil Mechanics* (3) Fox
 1960-61 and alternate years: spring—evening. Theories of soil strength and conditions for failure, bearing capacity of footings, pile foundations, theories of lateral earth pressure, stability of slopes, soil dynamics.
- 251 *Theory of Structures I* (3) Hechtman
 Spring—evening. Classical and modern methods of structural analysis; basic theory of plane structures; statically indeterminate structures, including continuous beams and trusses and arches; limit-load analysis; special problems.
- 252 *Space Structures* (3) Hechtman
 1960-61 and alternate years: spring—evening. Theory of structures in three dimensions: trusses, rigid frames, and thin-shell structures.
- 253 *Theory of Structures II* (3) Hechtman
 1961-62 and alternate years: fall—evening. Statically indeterminate structural theory, including single and multi-span rigid frames and arches, deflection theory for arches and suspension bridges, thermal stress, and failure of structures.
- 256 *Theory of Elastic Stability* (3) Hechtman
 1960-61 and alternate years: fall—evening. Beam-column problems and methods of analysis (including numerical analysis); lateral buckling of beams; buckling of rigid frames, arches, plates, stiffened plates, and shells; inelastic buckling.

ENGINEERING SCIENCE

The following courses serve as foundations for specialization, since they are concerned with a body of knowledge applicable in a variety of engineering fields.

SECOND GROUP

- 130 *Introductory Astronomy* (3) Grisamore
 Spring—evening. Coordinate systems and nomenclature used in astronomy, description of astronomical systems from solar system to metagalaxies, introduction to celestial mechanics, types of stars, stellar physics. Prerequisites: integral calculus and one year of college physics.
- 154 *Automatic Control** (4) Crafton, dePian
 Spring—morning and evening. Theory of automatic control systems including electromechanical, pneumatic, and hydraulic systems. Transient analysis, transfer functions, stability criteria. Experimental study of automatic control systems. Lecture and laboratory. Prerequisite: Electrical Engineering 127 or Mechanical Engineering 123. Laboratory fee, \$11.

THIRD GROUP

- 201 *Automatic Control* (3) Crafton
 Fall—evening. Advanced theory of automatic control. Systems analysis, multiple-loop systems, nonlinear systems.
- 211 *Analysis of Engineering Systems I* (3) Arkilic
 Fall—evening; spring—evening. A course in the mathematical analysis of engineering systems employing such topics as complex variables, infinite series, orthogonal functions, matrices and vector spaces, partial differential equations, probability, and calculus of variations. The required level of preparation is equivalent to Mathematics 111 and 112 as given at this University.
- 212 *Analysis of Engineering Systems II* (3) Arkilic
 Fall—evening; spring—evening. Continuation of Engineering Science 211. Mathematical topics include: functions of complex variables, operational and transform methods, numerical solutions of differential equations, finite differences, matrices.
- 217 *Analytical Mechanics* (3) Crafton
 Fall—evening; spring—evening. Fundamental principles, generalized coordinates, variational principles and Lagrange's equations, nonholonomic systems, Hamilton's equations, theory of small oscillations.
- 218 *Mechanics of Orbits and Trajectories* (3) Crafton
 1960-61 and alternate years: fall—evening. Celestial mechanics. Orbits and trajectories in force fields. Dynamics of space vehicles.
- 220 *Nonlinear Mechanics* (3) Crafton
 Spring—evening. Topological and analytical methods in nonlinear mechanics, nonlinear resonance, relaxation oscillations.
- 221 *Theory of Elasticity I* (3) Arkilic
 Fall—evening. Introduction to mathematical theory of elasticity, analysis of strain and stress, generalized Hooke's law, equilibrium equations, Beltrami-Michell equations, strain energy functions, torsion, general flexure.
- 222 *Theory of Elasticity II* (3) Arkilic
 1961-62 and alternate years: spring—evening. First and second boundary-value problems in plane elasticity, uniqueness of solutions, simply and multiply

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies.

connected regions, three-dimensional problems, thermoelasticity, vibration of elastic solids, variational methods.

231 *Fluid Dynamics* (3)

Fall—evening. Theory of compressible and incompressible fluid motion including potential motion, circulation and vorticity, mathematical treatment of flow at sub-, trans-, and supersonic velocities, normal and oblique shock, and elements of heat transfer. Crafton

233 *Engineering Problems* (3)

Spring—evening. Investigation of problems in engineering science, emphasizing imaginative and systematic application of fundamental principles in engineering, physics, and mathematics. dePian

241 *Science of Engineering Materials* (3)

1961-62 and alternate years: spring—evening. Relation of the atomic and microscopic structure of engineering materials to their physical and mechanical properties and their mechanical behavior in engineering applications. The Staff

299-300 *Thesis* (3-3)

Academic year—as arranged.

CLASSICAL LANGUAGES AND LITERATURES*

Professor J. F. Latimer (*Executive Officer*)

The Department of Classical Languages and Literatures offers two types of courses: (1) the course on *Greek and Roman Backgrounds in Literature*, which illustrates the literary, linguistic, and cultural backgrounds of Western Civilization, and for which no knowledge of the ancient languages is required. This course is designed to supplement and strengthen the broad general backgrounds of students who plan to concentrate in the fields of English or other literatures, History, Art, Drama, or Philosophy, or of those who wish to increase their general knowledge and appreciation of the bases of the great humanistic traditions as part of a well-rounded education. (2) Two years of Latin and two years of Greek are offered. These courses may be elected in fulfillment of the language requirements of the Junior College as set forth on pages 68-69.

COURSE IN ENGLISH TRANSLATION

71-72 *Greek and Roman Backgrounds in Literature* (3-3)

First half: spring—morning. Second half: not offered 1960-61. Selected Greek and Roman masterpieces and their literary influence. Latimer

LANGUAGE COURSES

1-2 *First-year Latin* (3-3)

A year course: credit is not given for the first half until the second half is completed. 1961-62 and alternate years. Functional presentation of the essentials of the language, with appropriate reading selections. Development of English derivatives, and introduction to Roman life and literature. Latimer

* The Staff of Instruction here listed is for the academic year 1959-60.

3-4 *Second-year Latin* (3-3)

Latimer

A year course; credit is not given for the first half until the second half is completed. 1960-61 and alternate years: academic year—evening. A continuation of the preceding course, but with increased emphasis on reading Latin selections which illustrate Roman life and literature. Continuation of vocabulary building in English. Prerequisite: Classical Languages 1-2 or two years of high school Latin.

11-12 *First-year Greek* (3-3)

Latimer

A year course; credit is not given for the first half until the second half is completed. 1960-61 and alternate years: academic year—evening. Essentials of grammar. Appropriate reading selections.

13-14 *Second-year Greek* (3-3)

Latimer

A year course; credit is not given for the first half until the second half is completed. 1961-62 and alternate years. Review of grammar. Emphasis on rapid reading from selected Greek authors.

RELATED COURSES IN ANOTHER DEPARTMENT

Art 101 *Ancient Art* (3)Art 102 *Medieval Art* (3)

DERMATOLOGY AND SYPHILOLOGY*

Professor H. F. Anderson (*Executive Officer*); Assistant Clinical Professors Hayden Kirby-Smith, J. Q. Gant, Jr.; Associates W. M. Willett, Reuben Goodman; Clinical Instructors C. S. Brown, Manuel Landman, W. G. Ballinger

214 *Dermatology and Syphilology*

The Staff

Spring—1 hour a week. Lectures on diseases of the skin and syphilis.

317-18 *Clinic*

The Staff

Case demonstrations, diagnosis, and treatment of skin diseases and syphilis. D. C. General Hospital.

407-8 *Clinic*

The Staff

Two hours a week as arranged in rotation during academic year. Dermatology and syphilology in infants and children. Children's Hospital.

409-10 *Clinic*

The Staff

Two hours a week as arranged in rotation during academic year. Clinical demonstrations, diseases of the skin. University Hospital.

ECONOMICS*

Professors A. E. Burns, D. S. Watson (*Executive Officer*), T. W. Holland; Professorial Lecturers George Wythe, Gerhard Colm, R. A. Young,

* The Staff of Instruction here listed is for the academic year 1959-60.

Hans Heymann, Jr.; *Associate Professors* E. C. Acheson, J. W. Kendrick, W. E. Schmidt*; *Assistant Professor* J. W. Skinner; *Lecturer* Henry Solomon

Bachelor of Arts with a major in Economics (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, including Economics 1-2 and Statistics 51, see page 69.

Required: the general requirements of Columbian College as stated on pages 81-87 and (1) Economics 101-2 and 121 and fifteen additional hours in second-group courses to be selected with the approval of the adviser; (2) Economics 198 which may be taken upon the completion of Economics 101-2 and 121; (3) Statistics 111, 112; (4) nine semester hours of other second-group courses selected from the following departments—Accounting, Business and Public Administration, History, Philosophy, Political Science, Sociology and Anthropology, and Statistics.

Bachelor of Arts with a major in Latin American Civilization (Columbian College—Field-of-Study).—See the Department of History.

Master of Arts in the field of Economics (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Economics at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91. The thirty hours of required work must include (1) Economics 210 and nine semester hours in courses numbered 201-208, 213, 215, 216, 251; (2) six semester hours in two of the following fields: public finance, monetary and fiscal policy (Economics 223-24, 261-62); labor economics (Economics 241, 244); economic policy (Economics 265-66); international relations (Economics 281-82, 290); and (3) thesis (Economics 299-300).

Doctor of Philosophy (Graduate Council).—See page 96.

Bachelor of Arts in Government with courses in Economics (School of Government).—See pages 179-81.

Master of Arts in Government with a major in Economic Policy (School of Government).—Prerequisite: the degree of Bachelor of Arts with a major in Economics at this University, or the equivalent.

Required: the general requirements for the degree are stated on pages 185-87, 188. The thirty hours of required work must include Economics 210, 265-66, and the thesis, Economics 299-300.

For information concerning other Master of Arts curricula in the School of Government with courses in Economics, see pages 187-89.

FIRST GROUP

1-2 Principles of Economics† (3-3)

Lecture (2 hours), recitation (1 hour). *First half:* fall—morning and evening; spring—morning and evening; summer 1960. *Second half:* fall—evening; spring—morning and evening; summer 1960. Survey of the major economic principles, institutions, and problems in contemporary life. Economics 1 is prerequisite to Economics 2. Skinner and Staff

SECOND GROUP

101-2 Economic Analysis (3-3)

First half: fall—morning and evening; spring—evening; summer 1960. *Second half:* spring—morning and evening. Analysis of demand, supply, and com- The Staff

* On sabbatical leave spring semester 1959-60.

† Economics 1-2 is prerequisite to all other courses in Economics.

- modity pricing; theory of national income determination; pricing of productive services; welfare economics. Economics 101 is prerequisite to Economics 102.
- 104 *History of Economic Thought* (3) Burns
Not offered 1960-61. History of the major schools of economic thought; influence of changing problems on the development of economic theory.
- 105 *Business Cycles* (3) Kendrick
Fall-evening. Analysis of strategic factors in economic instability, survey of recent business cycle theories.
- 121 *Money and Banking* (3) Acheson
Fall-morning and evening; spring-evening; summer 1960. Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems.
- 123 *Monetary Theory and Policy* (3) Acheson
Fall-morning. Principal contemporary theories, background of recent monetary policy.
- 124 *Financial Institutions and Economic Development* (3) Acheson
Not offered 1960-61. Evolution and growth of the money-mechanism in United States economy, changing relationships of money markets to role of investment, special emphasis on monetary framework for national economic development.
- 126 *Foreign Exchange and International Finance* (3) Acheson
Spring-morning. The theory and practice of the foreign exchanges; current methods of international transfer.
- 133 *The Economy of the Soviet Union* (3)
Not offered 1960-61. Development and main features of the economic life of the Soviet Union (See History 146, 246, and Geography 196).
- 141 *Industrial Relations* (3) Holland
Fall-morning. Development and practice of collective bargaining in American industry. Public control of industrial relations.
- 142 *Labor Economics* (3) Holland
Spring-morning. Wages, hours, and employment; standards of living; public policy.
- 161-62 *Public Finance and Taxation* (3-3) Schmidt
1960-61 and alternate years; academic year-evening; 1961-62 and alternate years; academic year-morning. General survey of government expenditures; sources and methods of taxation; economic effects of expenditures, taxes, and of government debt policies.
- 165 *Government Control of Economic Activity* (3) Watson
Fall-evening. Changing role of government in promoting and regulating economic activity, types and spheres of control.
- 181-82 *International Economics* (3-3) Schmidt
Academic year-afternoon and evening; summer 1960-Economics 181 (3). Survey of world economics, theories of international trade, analysis of international economic problems and the international organizations.

- 183-84 *International Economic Policy* (3-3) Acheson
Not offered 1960-61. Historical and theoretical analysis of tariffs, exchange rates, exchange and trade control, discrimination, and capital movements; policies related thereto.
- 185-86 *Economic History and Problems of Latin America* (3-3)
Academic year—evening. Evolution of the economies of Latin America with particular emphasis on present structures and problems, considered in the regional, country, and sub-region contexts. Economics 185, special attention to Middle America; Economics 186, special attention to South America.
- 198 *Proseminar in Economics* (3) Skinner
Fall—as arranged; spring—as arranged. Comprehensive survey of economics. Prerequisite: Economics 101-2 and 121.
- THIRD GROUP
- 201-2 *History and Literature of Economic Thought* (3-3) Burns
Academic year—evening. Critical analysis and interpretation of the development and the literature of economic thought, origins, and problems, of the major types of theory, and their relation to present problems and policies.
- 203-4 *Contemporary Economic Theory* (3-3) Watson
Academic year—evening. The contributions of Marshall, Chamberlin, Robinson, Hicks, and others.
- 205 *Theory of Employment and Income* (3) Kendrick
Fall—evening. Determinants of the level of employment and income. Keynesian and classical systems contrasted, and recent literature on the subject.
- 206 *Business Cycle Theory* (3) Kendrick
Spring—evening. The general characteristics of business cycle theories and discussion of particular theories.
- 208 *The National Income* (3) Kendrick
Fall—evening. The theory of economic aggregates; measurement and policy aspects of national income.
- 209 *Uses of the National Income Accounts* (3) Kendrick
Spring—evening. Uses of national income estimates in analysis of historical relationships, and for forecasts and policy decisions by business firms and governments; case studies include international comparisons.
- 210 *Seminar in Economics* (3) Skinner
Academic year—evening. Integration of economic theories; methods of research. Open only to students who have completed fifteen hours of graduate work in economics.
- 213 *Economic Thought in the Twentieth Century* (3) Burns
Summer 1960. Continuation of Economics 201-2. The principal trends in economic thought during the present century.
- 215 *Introduction to Mathematical Economics* (3) Solomon
Fall—evening. The mathematics of partial and general equilibrium theory. Prerequisite: permission of the instructor.

- 216 *Input-Output Analysis* (3) Solomon
Spring—evening. Leontief's theory and subsequent development. Input-output models. Empirical methods and problems. Applications.
- 219 *Managerial Economics* (3) Watson
Summer 1960. Analysis of price, production, and inventory policies of business firms.
- 223-24 *Monetary Policy and Central Banking* (3-3) Young
Academic year—evening. The money system in its relation to national income; monetary policies of the Federal Reserve and other central banking systems.
- 241 *Labor Economics* (3) Holland
Fall—evening. Implications of industrialism for labor, questions of social policy, contributions of economics to solutions of labor problems.
- 244 *Collective Bargaining* (3) Holland
Spring—evening. The collective bargaining contract and the elements comprising it, analysis of the policies of labor and of management.
- 246 *Foreign Labor Movements* (3) Holland
Spring—evening. Labor in the economic, social, and political structures of selected foreign countries. Contrasts and comparisons with the United States.
- 251 *Theories of Economic Development* (3)
Summer 1960. Growth and change in economic activity, capital accumulation, innovations in technology and business organization.
- 253 *Productivity Analysis* (3) Kendrick
Not offered 1960-61. Concepts and measures of productivity; relations to economic growth and to structural changes in the American economy.
- 261-62 *Public Finance and Fiscal Policy* (3-3) Colm
Academic year—evening. Survey of the major contributions to the theory and doctrines of public finance. Special problems: budget problems; current tax problems; and federal, state, and local relationships.
- 265-66 *Theory of Economic Policy* (3-3) Watson
Academic year—evening. The nature, forms, methods, and objectives of economic policy; the relation of economic theory to economic policy.
- 267 *Economic Organization of the Communist Orbit* (3) Heymann
Fall—evening. Development of the Soviet-type economy; organization under the Soviets; policies and problems: monetary, fiscal, production, allocative, foreign trade, economic growth. (See also History 146, 246, and Geography 196.)
- 281-82 *International Economics* (3-3) Schmidt
Academic year—evening. The modern theories of international economics, the variables determining the balance of payments, techniques to obtain balance-of-payments equilibrium.
- 284 *United States Foreign Economic Policy* (3) Schmidt
Not offered 1960-61. Analysis of foreign aid program; international, commercial, and monetary policy of the United States; United States and international economic organization.

- 285-86 *Economic Development of Latin America* (3-3)
Not offered 1960-61. Current policies and programs, capital formation, public and private; foreign loans and investment; social and technological preconditions of investment.
- 287-88 *Latin America: Trade and Commodity Policy* (3-3)
Not offered 1960-61. Tariffs and exchange control systems, bilateral and general commercial agreements, terms of trade.
- 290 *Problems in International Financial Policy* (3)
Spring-evening. International financial problems in recent decades and analysis of external economic problems of several countries. Acheson
The Staff
- 299-300 *Thesis* (3-3)
Academic year—as arranged; summer 1960.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following courses for students enrolled in the Navy Graduate Comptrollership Program and the Air Force Advanced Management Program.

- 191 *Foreign Economic Policies and Problems* (3)
195 *Governmental and Industrial Economics* (3)
(Summer 1960)

Schmidt
Watson

EDUCATION*

Professors J. H. Fox, B. H. Jarman†, B. S. Root (*Executive Officer*), A. C. LaBue, G. L. Angel; *Professorial Lecturers* M. K. Remmlein, F. M. Lumsden, H. O. Johnson, Anthony Marinaccio, Clayton Hutchins, Kenneth Brown, John Holden, B. D. Joy, Robert Jacobs, J. P. Walsh, D. D. Darland; *Associate Professor* M. E. Coleman; *Associate Professorial Lecturers* J. C. Lang, L. C. Walker, R. R. Reed, E. C. Nowlin, G. G. Jenkins, C. G. Stratemeyer; *Assistant Professors* C. R. St. Cyr, W. A. McCauley, H. G. Detwiler, R. E. Baker; *Lecturers* L. B. Hanigan, John Giancaspro, B. A. Crump, Z. M. Huse, J. W. Suber, J. W. Tyler, Ward Whipple, H. E. Wilson, Edwina Deans, E. M. Logan, C. O. McDaniels, E. F. Rhodes, R. W. Eller

FIELD STUDIES

Director R. W. Eller, Assistant Director J. W. Charles

FIELD SERVICE COORDINATORS

Alexander Anderson, Assistant Principal, Washington-Lee High School, Arlington, Va.; M. F. Maré, Assistant Principal, Dean of Girls, Wake-

* The Staff of Instruction here listed is for the academic year 1959-60.
† On leave of absence spring semester 1959-60.

field High School, Arlington, Va.; C. M. Richmond, Principal, Stratford Junior High School, Arlington, Va.

Bachelor of Arts in Education (School of Education).—Prerequisite: the Education curriculum in the Junior College or the equivalent, or a certificate of graduation from an approved normal school or the equivalent, see page 72.

Required: the satisfactory completion of a program of at least sixty-six semester hours in addition to the general education background courses in the Junior College curriculum. Each program is planned individually to meet the certification requirements of the student, see pages 157-67.

Master of Arts in Education (School of Education).—Prerequisite: a Bachelor's degree from an accredited institution. Programs are planned individually. The following areas of specialization are available: (1) school administration—secondary school principalship, or elementary school principalship; (2) adult education; (3) secondary education; (4) elementary education; (5) comparative education; (6) curriculum; (7) employee training; (8) guidance; (9) history of education; (10) philosophy of education; (11) reading; (12) teacher education. (See pages 170-72.)

Advanced Professional Certificate (School of Education).—See pages 172-74.

Doctor of Education (School of Education).—See pages 174-75.

A Reading Clinic

Coleman and Staff

Diagnosis of reading difficulties; individual or group lessons without academic credit. Fee: for individual diagnosis, \$35; for individual instruction, \$4.50 a lesson; for semi-individual instruction, \$3.50 a lesson; for instruction in small groups with common reading difficulties, \$2.75; material fee, \$4.

SECOND GROUP

109-10 Human Development, Learning, and Teaching

Baker

(3-3)

Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. *First half:* fall—afternoon and evening; summer 1960. *Second half:* fall—afternoon; spring—afternoon and evening; summer 1960 (Angel, Detwiler). For the general student as well as the prospective teacher. *First half:* nature of human growth, development, and learning, illustrated by observation of children in learning situations. *Second half:* nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations.

111 Methods in Elementary Education (12)

Baker and Staff

Fall—Monday through Friday mornings. For seniors in the elementary school curriculum. Methods, materials, appraisal, and field experiences in elementary schools. Problems and procedures in teaching the language arts (including reading, literature for children, oral and written expression, spelling, and handwriting), arithmetic and science, social studies. Planning units of work, general classroom procedures, and evaluation of pupil progress. Observation and participation two mornings a week. Prerequisite: Education 109-10 and 121-22.

112 Guidance in Elementary Schools (3)

McCauley, ———

Fall—evening; spring—evening; summer 1960. Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Education 109-10, 121-22.

- 113 *Elementary School Art* (3) Nowlin
 Fall and spring: lecture and laboratory (3 hours)—evening, field work—as arranged; summer 1960 (Crump). For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Material fee, \$4.50.
- 114 *Elementary School Music* (3) Reed
 Fall and spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1960. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22.
- 115 *Teaching of Reading in the Elementary School** (3) Hanigan
 Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1960 (Huse). A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 116 *Elementary School Social Studies** (3)
 Fall: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1960 (Stratemeyer). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 117 *Elementary School Science** (3) St. Cyr
 Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1960. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 120 *Elementary School Arithmetic** (3)
 Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1960 (Baker). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 121-22 *Society and the School* (3-3) St. Cyr
 Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. *First half:* fall—afternoon and evening; summer 1960 (Rhodes). *Second half:* fall—afternoon; spring—afternoon and evening; summer 1960 (Eller, Rhodes). For the general student as well as the prospective teacher. *First half:* the historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. *Second half:* organization and operation of schools; principles and functions; role of the teacher.
- 128 *Children's Literature** (3) Walker
 Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1960 (Wilson). For teachers. Exploring and evaluating the newer books for children and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22.
- 131 *Common Teaching Skills in Secondary Schools* (3) Detwiler
 Fall—early afternoon; spring—late afternoon. For seniors in the secondary school curriculum. Course, unit, and lesson planning; practical techniques used.

* This course may not be taken by students who have completed or who plan to enroll in Education 111.

in connection with motivation, the assignment, group procedures, directing study, individual differences, evaluation, clerical routines, disciplines, the home-room, activity sponsorship, public relations. Prerequisite: Education 109-10 and 121-22.

133-34 *Observation and Student Teaching in Secondary Schools* (3-3 to 6) Detwiler

A year course: credit is not given for the first half until the second half is completed. 133A: fall—as arranged; 133B: spring—as arranged. 134A and 134B: spring—as arranged. For seniors in the secondary school curriculum. Section B is for students enrolled in the intensive program. Education 134 student-teaching fee, \$50. Admission by permission of the instructor. Prerequisite: Education 109-10 and 121-22.

135 *Student Teaching in Elementary Schools* (9) Baker, McCauley

135A, 135B, and 135C: spring—as arranged. For seniors in the elementary school curriculum. Student-teaching fee, \$50. Admission by permission of the instructor. Prerequisite: Education 109-10 and 121-22.

SPECIAL METHODS COURSES*

To be elected in the senior year after substantial preparation in the teaching fields concerned by the students in the secondary school curriculum. Course requirements and hours of credit vary with license requirements. Practices of successful teachers are studied and actual teaching content as found in current texts and courses of study is reviewed.

136 *Teaching English* (2 to 4) Lumsden

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: eighteen semester hours in English.

138 *Teaching Social Studies* (2 to 4) Whipple

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: twenty-four semester hours of social studies.

140 *Teaching Mathematics* (2 to 4) Brown

Spring—evening. Prerequisite*: Mathematics through calculus.

144 *Teaching Science* (2 to 4) Eller

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: twenty-four to forty semester hours of science.

146 *Teaching Foreign Languages* (2 to 4) McSpadden

Spring—late afternoon. Prerequisite*: eighteen semester hours of one foreign language.

148 *Teaching Home Economics* (2 to 4) Kirkpatrick

Spring—as arranged. Prerequisite*: thirty semester hours of Home Economics.

150 *Teaching Business Subjects* (2 to 4) Shott

Spring—as arranged. Prerequisite*: thirty semester hours of business education.

* Prerequisite to all special methods courses: Education 109-10, 121-22, and 131. Additional prerequisites are stated under each course.

THIRD GROUP*

- 201-2 *Human Development, Learning, and Teaching* McCauley
(3-3)
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged.
First half: fall—evening. *Second half:* spring—evening. For graduate students. *First half:* nature of learning approached through the study of classroom situations. *Second half:* nature of teaching approached through observation of classroom situations.
- 203-4 *Comparative Education* (3-3)
Not offered 1960-61. Comparison of foreign educational systems with those of the United States; particularly those of Russia, West Germany, Denmark, Switzerland, France, the British Isles, Canada, and Australia.
- 205-6 *The Curriculum*† (3-3)
Academic year—Saturday morning. For experienced teachers. *First half:* curriculum foundations and issues; comparison of curriculum patterns. *Second half:* principles and procedures in curriculum development; group consideration of student problems.
- 207 *Curriculum Materials*† (3)
Summer 1960. For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations.
- 209 *Child Growth and Development* (3)
Fall—evening. An interdisciplinary approach to child development taking into account such factors as society and culture, socialization, and socializing agents with particular emphasis on the home and school.
- 210 *Adolescent Growth and Development* (3)
Spring—evening. A consideration of physical, intellectual, and cultural backgrounds of adolescence with particular emphasis on social development, adjustment to organized society, educational development and adjustment to school, and home relationships.
- 211 *Evaluation in Education*† (3)
Fall—evening; summer 1960. Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation.
- 212 *Educational Measurement* (3)
Spring—evening. Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay-type examinations; statistical analysis of test results; laboratory experiences in the use of test instruments.
- 213-14 *History of Education* (3-3)
Academic year—evening. *First half:* the European backgrounds of American education. *Second half:* the evolution of the American school system.

* A degree from an accredited institution is prerequisite to all third-group courses.
† Prerequisite: adequate professional preparation.

- 215 *Education of Exceptional Children** (3) LaBue
Summer 1960. For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance.
- 216 *Education of Slow-learning Children** (3) LaBue
Not offered 1960-61. Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.
- 217-18 *Philosophy of Education** (3-3)
Academic year—evening; summer 1960—Education 218 (3). *First half:* designed to help students formulate a personal philosophy of education. *Second half:* social foundations of education—a study of the forces that shape the policies and offerings of the school.
- 219 *Elementary School Classroom Procedures** (3) LaBue
Summer 1960. Current classroom practices with particular emphasis on ways of planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences.
- 221 *Early Childhood Education** (3)
Not offered 1960-61. For experienced teachers. Emphasis on methods, materials, and learning experiences designed to meet the developmental needs of kindergarten and primary-grade children.
- 223-24 *Reading Problems** (3-3) Coleman
Academic year—evening. For experienced teachers. Study of reading difficulties on elementary and secondary school levels; classroom and clinical procedures in solving reading problems.
- 225 *Elementary School Reading* (3) Coleman
Summer 1960. For experienced teachers. Developmental and remedial approaches to reading problems. Demonstration of diagnostic and corrective techniques used by the classroom teacher and the reading specialist.
- 227 *Basic Issues in Elementary Education* (3) LaBue
Fall—Saturday morning. A consideration of basic issues in the purposes, organization, and conduct of elementary education. Emphasis on the philosophical and psychological roots of fundamental assumptions as they relate to classroom practices.
- 228 *Instructional Areas in Elementary Education* (3) LaBue
Spring—Saturday morning. Critical appraisal of the objectives, organization, content, and teaching methods in the language arts, arithmetic, social studies, science, arts and crafts, health and physical education.
- 229 *Administration of Elementary Education* (3)
Spring—evening; summer 1960. For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action.

* Prerequisite: adequate professional preparation.

- 231 *Secondary School Classroom Procedures** (3) Giancaspro
Fall—evening; summer 1960. Survey of current classroom practices with particular attention to selected topics such as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.
- 233 *Audio-visual Education** (3)
Spring: lectures (2 hours), laboratory (1 hour)—evening. Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the care, operation, maintenance, and use of audio-visual materials and equipment. Material fee, \$7.
- 234 *Teaching Composition in the Junior and Senior High School* (3) Lumsden
Summer 1960. For experienced teachers of English. Methods and materials for improving writing skills; exploring ways to achieve the goal of a theme a week as recommended in the Conant Report. Particular attention to successful techniques, standards of performance, methods of grading; use of style sheets and literary models, and the relationship of the study of grammar to writing.
- 241 *Education of the Gifted** (3) Jenkins
Spring—evening; summer 1960. For classroom teachers. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects.
- 243 *Human Relations in the Classroom** (3) Marinaccio
Summer 1960. Principles and practices involved in interpersonal relationships between learner and teacher and among learners.
- 245 *School and Community** (3) Angel
Spring—evening; summer 1960. The school as an important member of a team of social agencies that builds the community.
- 247 *Vocational Education** (3) Walsh
Summer 1960. Development in the United States; current conceptions, agencies involved, problems, and trends.
- 251 *Guidance in Secondary Schools** (3) McDaniels
Fall—evening; summer 1960. Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program.
- 254 *The Junior High School** (3) Root
Not offered 1960-61. Purposes, organization, core programs, guidance, developing course of study, extra-classroom activities.
- 255-56 *Secondary Education** (3-3) Root
Academic year—Saturday morning; summer 1960. First half: current proposals for the improvement of secondary education. Second half: current problems in each of the subject-matter fields.
- 259-60 *Secondary School Management** (3-3) Johnson
Academic year—Saturday morning. For experienced teachers and administrators with two years of successful teaching in secondary schools. Management.

* Prerequisite: adequate professional preparation.

ment planning, execution, and control; criteria of good management; construction of the master schedule; leadership problems incident to the development of new policies and programs.

263-64 *Employee Training* (3-3)

Root

Academic year—evening. *First half*: nature and purpose, review of major programs—orientation, supervisory, apprentice, clerical skills, communication. *Second half*: administrative problems and practices, training media, coordination with other management functions. Prerequisite: adequate professional preparation or two years of experience in employee training.

265-66 *Teaching Secondary School English* (3-3)

Lumsden and
Guest Lecturers

Not offered 1960-61. A refresher course for teachers of English. Discussion of new approaches to high school content. Offered in cooperation with the departments of English and Speech. *First half*: communication skills—structural linguistics, composition, and speech. *Second half*: American and English literature.

267-68 *Teaching Secondary School Social Studies* (3-3)

Whipple

Academic year—evening. A refresher course for teachers of the Social Studies. Discussion of new approaches to high school content. Offered in cooperation with the departments of History, Political Science, Geography, Economics, and Sociology and Anthropology.

270 *Art Education* (3)

Nowlin

Not offered 1960-61. For experienced teachers. Basic philosophies of contemporary teachers of art; use of visual and tactile media; emphasis upon visual aids, displays, and use of community resources. Designed to increase awareness of the creative process. Prerequisite: Education 113. Material fee, \$4.50.

271 *The Teacher and School Administration** (3)

Fox

Fall—evening; summer 1960. A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions.

272 *The Teacher and School Supervision** (3)

Fox

Spring—evening. Nature, organization, human relationships, and techniques.

273-74 *Teacher Education** (3-3)

LaBue

Not offered 1960-61. *First half*: aims, objectives, and basic issues; study of outstanding and experimental programs. *Second half*: recruitment and selection, general education, teaching-field preparation, professional sequences, laboratory experiences.

275 *School Finance** (3)

Hutchins

Summer 1960. Educational financial theory, practice, and control, including methods of financing.

276 *Seminar: Public Relations in School Administration** (3)

Spring—evening. Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.

* Prerequisite: adequate professional preparation.

- 278 *School Law** (3) Remmlein
Not offered 1960-61. Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group.
- 279-80 *Adult Education** (3-3) Holden
Academic year—evening; summer 1960—Education 280 (3) (Detwiler).
First half: current concepts and objectives, agencies involved, programs on all levels—international through community. *Second half:* the adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs.
- 281 *Group Procedures in Education** (3) Detwiler
Fall—evening. Theory, practice, evaluation, and application to all educational levels.
- 285 *Extra-classroom Activities** (3)
Fall—evening. Nature and purposes of selected activities—homeroom, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation.
- 287-88 *Clinical Study of Reading Problems** (3-3) Coleman
Academic year—Saturday morning. For advanced students. Diagnostic and corrective work under supervision of the Reading Clinic. Each student is expected to diagnose and treat pupils who are retarded in reading. Case studies are presented and criticized. Prerequisite: Education 223-24 or the equivalent. Material fee, \$5 a semester.
- 289-90 *Supervisory Problems in Reading** (3-3) Coleman
Not offered 1960-61. For experienced teachers, principals, supervisors, and superintendents. Considers the problems involved in planning, reorganizing, and improving the total reading program, in promoting cooperative effort on the part of the staff toward increasing teaching efficiency.
- 291 *Planning the School Plant* (3) Hamon
Not offered 1960-61. Selection of sites; evaluation of existing buildings; utilization of present facilities; adaptation to curricular needs; building, operation, and maintenance problems.
- 293-94 *Research* (3-3)
Academic year—as arranged. Individual research under the guidance of a member of the staff. Program and conferences arranged with an instructor. The Staff
- 295 *Educational Research Methods and Procedures* (3) LaBue
Academic year—late afternoon; summer 1960. Required of all Master of Arts candidates following Plan 2. Knowledge of elementary statistics required.
- 297 *Reading in Education* The Staff
Academic year—late afternoon; summer 1960. To assist those preparing for the comprehensive examinations. No credit toward degree requirements. Tuition fee, \$24.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged. Required of all Master of Arts candidates following Plan 1.

* Prerequisite: adequate professional preparation.

ELECTRICAL ENGINEERING*

Professors N. B. Amest†, Ernest Frank; *Professorial Lecturers* F. K. Harris, Robert Kahal; *Associate Professors* Louis dePian, N. T. Grisamore (*Executive Officer*); *Assistant Professors* R. S. Ledley, L. A. Rubin; *Lecturers* K. M. Lovewell, George Abraham, W. W. Balwanz, George Pida, William Alderson, P. H. Sawitz, L. S. Rotolo, J. L. Baxter, J. A. Cunningham, Howard Eisner; *Instructor* C. D. Ferris; *Associates* D. C. Rohlf, W. R. Smith III, T. B. Wiggins

Bachelor of Electrical Engineering (School of Engineering).—See pages 132–34 and 135–36 for statement of requirements.

Master of Science in Engineering (School of Engineering).—See pages 139–40 for statement of requirements.

Doctor of Science (School of Engineering).—See pages 142–44 for statement of requirements.

FIRST GROUP

- 11 *Electric Circuits* (3) Rubin and Staff
Fall—morning and evening; spring—morning and evening. Current, voltage, power, Kirchhoff's laws, steady-state mesh and node analysis, simple transients, matrices and determinants, network theorems, resonance, balanced polyphase circuits. Prerequisite: Mathematics 30. Prerequisite or concurrent registration: Physics 15.
- 12 *Electric Machinery* (3) The Staff
Fall—morning and evening; spring—morning and evening. Analysis of d-c and a-c rotating machines in steady state, theory of idealized transformers. Emphasis is placed on electromechanical energy conversion. Prerequisite: Electrical Engineering 11.

SECOND GROUP

- 102 *Engineering Electronics* (3) dePian and Staff
Spring—morning and evening. Introductory treatment of physical concepts of electron-tube and semi-conductor devices, their electrical characteristics, and their use in electronic circuit applications. Linear and nonlinear methods of analysis. Prerequisite: Electrical Engineering 11, Mathematics 112.
- 103 *Electric and Magnetic Fields* (3) dePian and Staff
Fall—morning and evening. Introduction to vector analysis; basic concepts of electrostatics and magnetics. Analysis of resistance, capacitance, inductance, forces, magnetic circuits. Prerequisite: Electrical Engineering 11, Mathematics 112.
- 104 *Field Analysis* (3) dePian, Ferris
Spring—morning and evening. Solid angle, method of images, vector potential, magnetic scalar potential, conformal mapping, solutions of Laplace's equation, field plotting, analogues. Particle motion in electric and magnetic fields. Introduction to Maxwell's equations. Prerequisite: Electrical Engineering 103, Mathematics 112.

* The Staff of Instruction here listed is for the academic year 1959–60.
† Deceased.

- 107 *Steady-state Network Analysis* (3) Ferris and Staff
Fall—morning and evening. Four-terminal networks, network theorems, poles and zeros of network functions, resonance, filters, coupled circuits, transmission lines, Fourier series, matrices. Prerequisite: Electrical Engineering 11, Mathematics 112.
- 111 *Electrical Measurements* (2) Rubin, Harris
Fall—morning and evening. Systems of units; theory of errors; d-c indicating instruments and galvanometer dynamics; precision measurement of voltage, current, and resistance. Prerequisite: Electrical Engineering 11, Mathematics 112.
- 112 *Electrical Measurements* (2) Rubin, Harris
Spring—morning and evening. Theory of a-c indicating instruments, a-c bridges, waveforms, frequency measurements, measurement of power and energy. Prerequisite: Electrical Engineering 107, 111.
- 113-14 *Electric Power Laboratory* (2-2) The Staff
Academic year—afternoon and evening. Experiments in d-c and a-c circuits, instruments, and machines. Prerequisite to Electrical Engineering 113; Electrical Engineering 12. Prerequisite to Electrical Engineering 114: Electrical Engineering 113. Laboratory fee, \$11 a semester.
- 118 *Electrical Energy Conversion* (3) Rubin
Spring—morning and evening. Analysis of physical systems involving electrical, mechanical, and thermal energy conversion; mathematical formulations using the Euler-Lagrange equation; transient and steady-state analysis of special machines including the generalized rotating energy converter. Prerequisite: Electrical Engineering 12, Mathematics 112. Prerequisite or concurrent registration: Electrical Engineering 104, 112.
- 122 *Measurements and Electronics Laboratory* (2) Ferris and Staff
Spring—afternoon and evening. Experiments with sources, meters, bridges, and simple electronic devices; network theorems and resonance; use of instruments and oscilloscope; measurement of resistance, capacitance, inductance. Prerequisite or concurrent registration: Electrical Engineering 102, 112. Laboratory fee, \$11.
- 123 *Electronic Devices and Systems Laboratory* (2) Rubin and Staff
Fall—afternoon and evening. Theory and use of electronic devices and instruments. Experiments in active networks, tubes and transistors, nonlinear elements, complex waveform analysis, transfer characteristics. Prerequisite: Electrical Engineering 122. Prerequisite or concurrent registration: Electrical Engineering 137. Laboratory fee, \$11.
- 124 *High-frequency Communications Laboratory* (2) The Staff
Spring—afternoon and evening. Experiments at radio- and microwave-frequencies: impedance, amplifiers, transmitters, lines, waveguides, slotted lines, antennas, horns, power, oscillators. Prerequisite: Electrical Engineering 123. Prerequisite or concurrent registration: Electrical Engineering 136. Laboratory fee, \$11.
- 125-26 *Project Laboratory* (2-2) Rubin
Academic year—as arranged. Creative projects and experiments with electrical and electromechanical devices and systems carried out under individual supervision. May be substituted for required courses. Prerequisite: Electrical

Engineering 122, senior status, and permission of instructor. Laboratory fee, \$11 a semester.

- 127 *General Network Analysis* (3) Ferris
Fall—morning and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeros of network functions, correlation of time and frequency domains, one-terminal- and two-terminal-pair networks. Prerequisite: Electrical Engineering 107, Mathematics 112.
- 133 *Engineering Analysis* (3) dePian
Fall—morning. Application of fundamental principles of engineering, physics, and mathematics to problems in various fields of engineering. Emphasis is placed on problem solving using concepts previously studied. Prerequisite: Civil Engineering 121; Electrical Engineering 102, 118; Mathematics 112; Physics 16.
- 136 *Electromagnetic Waves* (3) Ferris and Staff
Spring—morning and evening. Electromagnetic waves in bounded media, radiation from antennas, high-frequency transmission lines, cavity resonators and microwave devices. Prerequisite: Electrical Engineering 104, Mathematics 112.
- 137 *Electronic Circuits and Systems* (3) dePian
Fall—morning and evening. Analysis of two-port networks; matrix representation of linear active networks; vacuum-tube and semiconductor circuit theory; concepts of feedback, stability, and oscillators. Nonlinear circuit analysis, modulation, detection, communication systems. Prerequisite: Electrical Engineering 102 or Physics 132, Electrical Engineering 107, Mathematics 112.
- 171 *Digital Circuitry and Systems* (3) Grisamore, Ledley
Fall—late afternoon. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits. Prerequisite: Mathematics 111, Electrical Engineering 102 or Physics 132.
- 172 *Digital Techniques* (3) Grisamore
Spring—late afternoon. Continuation of Electrical Engineering 171. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic-core circuits, memory systems, analog-to-digital techniques, wiring diagrams. Prerequisite: Electrical Engineering 171.
- 174 *Digital and Analog Computer Laboratory* (2) The Staff
Spring—afternoon. Theory and use of digital and analog computers: programming, operating, logical circuitry, design, troubleshooting. Prerequisite: Electrical Engineering 137, 171. Laboratory fee, \$11.
- 189-90 *Proseminar in Electrical Engineering* (1-1) Rubin and Staff
Academic year—late afternoon. Oral and written presentation of technical and nontechnical papers by students, with group discussion and critical analysis. Prerequisite: senior status.
- 191 *Proseminar in Digital Computers* (1) Ledley
Fall—late afternoon; spring—late afternoon. Oral and written presentation of technical and nontechnical papers based on current literature and on orig-

inal studies, with group discussion and critical analysis. Prerequisite: senior status.

THIRD GROUP

- 203 *Operational Analysis of Linear Systems* (3) Alderson
Fall—evening. Transient analysis of linear, lumped-parameter electrical and mechanical systems by operational methods with emphasis on Laplace transforms.
- 205 *Electronic Circuit Analysis* (3)
Spring—evening. Methods of linear and nonlinear analysis applied to passive and active networks including vacuum-tube and transistor circuits, and magnetic and dielectric amplifiers.
- 207 *Steady-state Network Analysis* (3) dePian
Spring—evening. Analysis of lumped, linear networks: determinants, loop and node analysis, network theorems, four-terminal networks, filters, complex frequency, network functions, and general network properties.
- 209 *Electromagnetic Field Analysis* (3) Grisamore
Fall—evening. Electrostatics, magnetics, and Maxwell's equations: solutions of Laplace's equation, retarded potentials, electromagnetic waves in bounded media, field analysis techniques.
- 211 *Physical Electronics* (3)
Fall—evening. Physical principles underlying operation of various electronic devices including vacuum tubes, electron lenses, transistors, and recent solid-state electronic devices.
- 215 *Analysis of Modulation and Noise* (3) Alderson
Spring—evening. Analysis by Fourier series and integrals of signals and linear networks, modulation and spectra, noise analysis including probability method of determining power spectra.
- 231 *Basic Concepts of Digital Computers* (3) Ledley
Spring—evening. The programmed system, logical and system design of digital computers, special-purpose digital computers, theory of switching circuits and computer logic, reliability, digital electronic circuits, modern developments.

ENGLISH*

Professors R. W. Bolwell (*Emeritus*), E. S. Shepard, F. S. Tupper, C. D. Linton, C. W. Cole (*Executive Officer*), R. H. Moore, J. H. Coberly; Associate Professors W. L. Turner, M. H. McClanahan, P. H. Highfill, Jr., J. G. Allee, Jr., J. P. Reesing, Jr., R. H. Walker, Jr.; Assistant Professors R. E. Gajdusek, E. T. Wright, N. M. Tischler, G. A. Santangelo, P. H. Stacy, P. C. Steele, J. G. Sweeney
Bachelor of Arts with a major in American Thought and Civilization (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69.

* The Staff of Instruction here listed is for the academic year 1959-60.
† On leave of absence academic year 1959-60.

Required: the general requirements of Columbian College as stated on pages 81-87 and the grade "pass" on the American Thought and Civilization major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined is summarized under four general headings: (1) European cultural history—the Renaissance and modern social and intellectual cultures as a background to contemporary civilization with particular attention to English literature and history from the 16th through the 19th centuries; (2) American history—the political, economic, social, and religious thought and experience of the American people; (3) American philosophy and fine arts—a survey of periods and movements with a knowledge of outstanding individuals; (4) American literature—a knowledge of major writers, together with a study of poetry, fiction, and drama. The Department of English provides a proseminar (English 179-80) intended to assist the student in preparing himself for the major examination. The major adviser will give to each student at registration a check list of available courses grouped as prerequisite, necessary, or desirable for the completion of the major study program.

Bachelor of Arts with a major in English Literature (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College described on page 69. It is recommended that prospective majors elect English 91-92 from among the listed offerings.

Required: the general requirements of Columbian College as stated on pages 81-87, and the passing of the English Literature major examination at the end of the senior year. The field of coordinated knowledge upon which the student will be examined at the end of his senior year is summarized under the following general headings: (1) the history of English literature from the Anglo-Saxon period; (2) the chief English writers (a certain familiarity with each man and his main works and a detailed knowledge of Shakespeare); (3) English social and political history as it bears upon or is reflected in the literature; (4) European intellectual backgrounds and movements which have affected English literature. The proportion of work taken in each of these areas should be worked out by the student in consultation with one of the English Literature advisers. The Department of English provides a proseminar (English 199-200) to assist the student in preparing himself for the major examination. A detailed description of the major is available in the Office of the Dean of Columbian College.

Master of Arts in the field of American Literary and Cultural History (Columbian College).—Prerequisite: the equivalent of an undergraduate major in this University in (1) History (with American history as a major part), (2) American Thought and Civilization, or (3) English Literature (with introductory courses in American literature and American history). The student who has not taken any of the above majors at this University must take a candidacy examination.

Required: in addition to the general requirements of Columbian College as stated on pages 88-91, the following specific requirements must be met: twelve of the required semester hours must be of seminar study, six in American history and six in American literature; twelve of the required semester hours must be of second and third group courses in the fields of American history, literature, philosophy, education, and art recommended by the adviser; a thesis (six semester hours) in any of the foregoing fields or in some combination of them. Because of the various undergraduate majors which will be accepted for admission to this program, a basic reading list is assigned to all students, to assist in preparing them for the final Master's examination.

Master of Arts in the field of English and American Literature (Columbian College).—Prerequisite: an undergraduate major in English Literature or American Thought and Civilization at this University; or twenty-four semester hours in English and/or American literature above the sophomore level. The student

who has not taken either of the above majors at this University must take a candidacy examination. The student offering split preparation (English and American literature) will be examined in English and American literature.

Required: in addition to the general requirements of Columbian College as stated on pages 88-91, the following specific requirements must be met: (1) a schedule of courses amounting to twenty-four semester hours, planned in consultation with the adviser; on the basis of the student's undergraduate preparation, to include a comprehensive survey of American literature and of English literature from 1600; (2) a Master's thesis (six semester hours) written upon an approved topic under the direction of the instructor in whose field the major portion of the material falls; (3) a final written examination on American literature and on English literature from 1600.

Master of Arts in the field of English Literature (Columbian College).—Prerequisite: an undergraduate major in English Literature at this University, or twenty-four semester hours in English literature above the sophomore level. The student who has not passed the major examination in English at this University must take a candidacy examination which, in its scope and difficulty, is comparable to the major examination in English.

Required: in addition to the general requirements of Columbian College as stated on pages 88-91, the following specific requirements must be met: (1) a schedule of courses amounting to twenty-four semester hours, planned in consultation with the adviser; (2) a Master's thesis (six semester hours) written upon an approved topic under the direction of the instructor in whose field the material falls; and (3) a final written examination.

Doctor of Philosophy (Graduate Council).—See page 96.

Bachelor of Arts in Education with a teaching field in English (School of Education).—Prerequisite: the Education curriculum, page 72.

Required: the English option, pages 161-62; and the professional courses listed on pages 166-67.

ENGLISH COMPOSITION*

FIRST GROUP

A *English for Foreign Students* (3)

Fall—morning and evening; spring—morning and evening; summer 1960. A course in reading and writing designed to assist the foreign student in overcoming deficiencies in the use of English. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary.

B *English for Foreign Students* (3)

Fall—morning and evening; spring—morning and evening. For second-semester foreign students not yet ready for English I. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style.

*Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English 1X.

All pre-Columbian College students (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1, both semesters of one of the introductory literature courses, and English 4.

English 1 is prerequisite to all other courses in English. English 2 is the second half of the six-hour composition course requirement of students not required to follow the pre-Columbian College sequence.

- 1 *English Composition** (3) Moore and Staff
Fall—morning and evening; spring—morning and evening; summer 1960.
Review of grammar, exercises in composition, readings.

- 1X *English Composition** (3) Moore and Staff
Fall—morning and evening; spring—morning and evening. An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets five hours a week and carries 3 semester hours of credit. The tuition fee is \$97 (the regular fee of \$24 a semester hour, plus an additional fee of \$25).

- 2 *English Composition** (3) Moore and Staff
Fall—morning and evening; spring—morning and evening; summer 1960.
For second-semester freshmen not following the pre-Columbian College curricula. Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1.

- 4 *English Composition** (3) Moore and Staff
Fall—morning and evening; spring—morning and evening; summer 1960.
The second half of the six-hour English Composition course required of students in the pre-Columbian College curricula. A course in critical analysis and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 and both semesters of one of the introductory literature courses.

- 11 *The Writing of Reports* (3) Turner and Staff
Fall—morning and evening; spring—morning and evening; summer 1960.
Theory and practice in the writing of technical reports. Prerequisite: English 1, and 2 or 4.

SECOND GROUP

- 109 *Expository Writing* (3) McClanahan and Staff
Fall—evening. A study of types of expository writing with weekly exercises. Prerequisite: English 1, and 2 or 4.

- 113 *Narrative Writing* (3) Steele
Fall—evening. Study of the techniques of narrative writing and class criticism of student writing. Prerequisite: English 1, and 2 or 4.

- 114 *The Writing of Fiction—the Short Story* (3) Steele
Spring—evening. Prerequisite: English 113; consent of instructor.

- 116 *Advanced Exposition* (3) Moore
Spring—evening. Theory and practice in the writing of expository articles and essays. Prerequisite: English 109; consent of instructor.

- 117-18 *The Writing of Fiction—the Novel* (3-3) Steele
Academic year—evening. Writing a novel. Prerequisite: English 114; consent of instructor.

* See footnote on page 278.

ENGLISH LITERATURE

FIRST GROUP

- 51-52 *Introduction to English Literature** (3-3) Tupper and Staff
Academic year—morning, afternoon, and evening; summer 1960. A historical survey. Prerequisite: English 1.
- 91-92 *Introduction to European Literature** (3-3) Shepard and Staff
Academic year—morning and evening. Consideration of various types. Prerequisite: English 1.

SECOND GROUP*

- 121-22 *English Literature from the Beginnings to 1500* (3-3) Allee
First half: not offered 1960-61. Second half: spring—evening; summer 1960.
First half: English literature prior to Chaucer. Second half: Chaucer.
- 125 *Introduction to English Linguistics* (3) Allee
Fall—evening. The development of the English language in a historical treatment of English grammar.
- 129-30 *Elizabethan Nondramatic Literature* (3-3) Tupper
Academic year—morning. Nondramatic literature from 1485 to 1601.
- 135-36 *Shakespeare* (3-3) Tupper
Academic year—morning; summer 1960—English 135 (3).
- 139-40 *The Seventeenth Century* (3-3) Reesing
Academic year—evening. First half: poetry and prose from 1603 to 1660.
Second half: Milton.
- 141-42 *The Neoclassical Movement* (3-3) Highfill
Academic year—morning. Poetry and prose from 1660 through the mid-18th century.
- 151-52 *The Romantic Movement* (3-3) Reesing
Academic year—evening. From the mid-18th century through Shelley and Keats.
- 161-62 *Victorian Literature* (3-3) Shepard
Summer 1960—English 162 (3). Poetry and prose from 1830 to 1900.
- 165-66 *The Twentieth Century* (3-3) Linton
Academic year—morning; summer 1960—English 165 (3). British poetry, prose, and drama since 1900.
- 181-82 *The English Novel* (3-3) Reesing
Academic year—morning. Major English novelists from the 18th century to the present day.

* All pre-Columbian College students (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1, both semesters of one of the introductory literature courses, and English 4.

English 51-52, 71-72, 91-92, Classical Languages 71-72, French 51-52, German 51-52, Slavic Languages 91-92, or Spanish 51-52 is prerequisite to all second-group courses except English 125.

- 183-84 *The English Drama* (3-3) Highfill
 Academic year—morning. *First half*: concerned principally with the drama of Shakespeare's contemporaries. *Second half*: a historical survey from 1660 to the present day.
- 192 *Medieval Legend and Saga* (3) Allee
 Not offered 1960-61. Celtic and Norse.
- 199-200 *Proseminar: Readings for the English Literature Major* (3-3) Tupper, Highfill
 Academic year—afternoon and evening. Conferences and group discussions.

THIRD GROUP

- 222 *The Age of Chaucer* (3) Allee
 Not offered 1960-61.
- 223-24 *Old English* (3-3) Allee
 Academic year—evening. English language and literature before 1100. *First half*: Old English grammar and readings. *Second half*: Beowulf.
- 225 *Applied Linguistics* (3) Allee
 Not offered 1960-61. Survey of the English language since 1850; introduction to analytical methods of structural linguistics and their application to modern American and British writing and to secondary school teaching of English.
- 235-36 *Studies in Shakespeare and His Contemporaries* (3-3) Tupper
 Not offered 1960-61. Prerequisite: English 135-36.
- 239-40 *Studies in Seventeenth Century Literature* (3-3) Reesing
 Not offered 1960-61. Open to qualified undergraduates. *First half*: chief figures exclusive of Milton. *Second half*: Milton.
- 241-42 *Studies in Neoclassical Literature* (3-3) Highfill
 Academic year—evening. Prerequisite: English 141-42.
- 251-52 *Studies in the Romantic Movement* (3-3) Reesing
 Summer 1960—English 252 (3). Prerequisite: English 151-52.
- 261-62 *Studies in Victorian Literature* (3-3) Shepard
First half: not offered 1960-61; *second half*: spring—evening. Prerequisite: English 161-62.
- 265-66 *Studies in Twentieth Century Literature* (3-3) Linton
First half: fall—evening; *second half*: not offered 1960-61. Eliot and his contemporaries.
- 295-96 *Studies in the History of English Literary Criticism* (3-3) Shepard
 Not offered 1960-61. Open to undergraduates with the approval of the instructor.
- 299-300 *Thesis* (3-3) The Staff

AMERICAN LITERATURE

FIRST GROUP

- 71-72 *Introduction to American Literature** (3-3) Cole and Staff
Academic year—morning and evening; summer 1960. A historical survey.
First half: from the beginnings to the Civil War. *Second half:* from the Civil War to the present. Prerequisite: English 1.

SECOND GROUP*

- 170 *The American Short Story* (3) Coberly
Summer 1960. The historical development of the short story in America.
- 171-72 *Studies in American Literature* (3-3) Walker
1960-61 and alternate years; academic year—evening; 1961-62 and alternate years; academic year—morning. Major factors in the national cultural tradition as shown by outstanding writers. Prerequisite: English 51-52 or 71-72.
- 173-74 *Major American Poets* (3-3) Coberly
Academic year—morning. Advanced critical study of significant writers and movements. *First half:* from beginnings through 19th century. *Second half:* the 20th century.
- 175-76 *American Drama* (3-3) Cole
1960-61 and alternate years; academic year—morning; 1961-62 and alternate years; academic year—evening; summer 1960—English 176 (3). Historical and critical study of significant plays and forms. *First half:* from beginnings through 19th century. *Second half:* the 20th century.
- 177-78 *American Fiction* (3-3) Coberly
1960-61 and alternate years; academic year—evening; 1961-62 and alternate years; academic year—morning. Historical and critical study of significant novels and short stories. *First half:* from beginnings through 19th century. *Second half:* the 20th century.
- 179-80 *Proseminar: Readings for American Thought and Civilization Majors* (3-3) The Staff
Academic year—afternoon and evening. Conferences and group discussions.

THIRD GROUP

- 271-72 *Seminar: American Literature* (3-3) Coberly
Academic year—as arranged. Prerequisite: English 171-72 or the equivalent.
- 277-78 *Studies in American Fiction* (3-3) Coberly
Academic year—evening; summer 1960—English 277 (3). Prerequisite: English 177-78 or the equivalent. Open to the undergraduate with the approval of the instructor.

* All pre-Columbian College students (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1, both semesters of one of the introductory literature courses, and English 4.

English 51-52, 71-72, 91-92, Classical Languages 71-72, French 51-52, German 51-52, Slavic Languages 91-92, or Spanish 51-52 is prerequisite to all second-group courses except English 171-72.

279-80 Thesis (3-3)

The Staff

RELATED COURSES IN OTHER DEPARTMENTS

Education 136, *Teaching English*
 History 151-52, *English History*
 Philosophy 111-12, *History of Philosophy*
 Speech B, *Spoken English*
 Speech 102, *Oral Interpretation of Literature*

GEOGRAPHY*

Professor R. D. Campbell (*Executive Officer*); Professorial Lecturers Eric Fischer, S. R. Abrahamson; Associate Professor H. W. Westermann; Assistant Professor J. T. Davis; Lecturer J. P. Pickard

Bachelor of Arts with a major in Geography (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69. It is strongly recommended that this curriculum include: Botany 1-2; Economics 1, 2; Geology 1-2; and Sociology and Anthropology 1-2. Electives must include Geography 51 and 52.

Required: in addition to the general requirements of Columbian College as stated on pages 81-87, twenty-four semester hours of Geography beyond first-group courses, including Geography 103-4, 115-16; fifteen semester hours in one or more of the following departments: Botany, Economics, Geology, History, Political Science, Sociology and Anthropology; and six semester hours of Mathematics or Statistics.

Master of Arts in the field of Geography (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Geography from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91. The thirty hours of required work must include Geography 201-2, 205-6, and 299-300.

Bachelor of Science in Cartography (College of General Studies).—See page 286, "Courses Offered in Special Programs," and the College of General Studies Catalogue for complete details.

Bachelor of Arts in Education with a teaching field in Geography (School of Education).—Prerequisite: the Education curriculum, page 72.

Required: the Geography option, pages 162-63 and the professional courses listed on pages 166-67.

Doctor of Philosophy (Graduate Council).—See page 96.

FIRST GROUP

51 *Introduction to Geography (3)*

The Staff

Fall—morning; spring—evening; summer 1961. A study of place attributes and characteristics, patterns and associations of physical and cultural earth features.

52 *World Regions (3)*

The Staff

Fall—evening; spring—morning; summer 1961. The analysis of world re-

* The Staff of Instruction here listed is for the academic year 1959-60.

gional divisions, description and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man.

SECOND GROUP

103-4 *Cartography* (3-3)

Davis

A year course: credit is not given for the first half until the second half is completed. Academic year—Saturday morning. Principles of cartographic drafting; elementary map projections; map and graph planning, design and construction; uses and interpretation of maps. Prerequisite: Geography 51 and 52. Laboratory fee, \$11 a semester.

115-16 *Physical Geography* (3-3)

Davis

Academic year: lecture (2 hours), laboratory and field trip (2 hours)—morning and Saturday afternoon. Introduction to the earth sciences: form of the earth, grids and time, weather and climate, geomorphic processes and land-forms, soils, vegetation; weather forecasting, map reading.

125 *Transportation Complexes* (3)

1961-62 and alternate years. A study of transportation networks and systems by which people, things, and ideas are given varying degrees of place utility. An analysis of the role of transportation in urban, national, and international relationships.

126 *World Food Supply* (3)

1961-62 and alternate years. World patterns of production and consumption of food stuffs, commercial and subsistence agriculture. World capabilities for feeding the world's population.

133 *Regional Industrial Structures* (3)

Westermann

Fall—evening. The nature of the industrial complex, types and distribution of industry, principles of industrial and economic development planning.

134 *Location of Industry* (3)

Pickard

Spring—evening. Structure and development of the major world industries, industrial location requirements, principles of industrial equilibrium.

141-42 *Urban Settlement* (3-3)

Westermann

1961-62 and alternate years. Location, functions, and forms of cities; urban-rural relationships; the urban hierarchy; bases for urban planning.

145 *World Cultural Geography* (3)

Campbell

Fall—afternoon. A study of differences in national character structures; modal behavior patterns and personality traits typical of various cultures; difficulties these differences present in interpersonal relations and intercultural communications.

146 *World Political Geography* (3)

Campbell

Spring—afternoon. Types and distributions of political systems, the major political units and associations of the world, factors which affect relative political power, areas of conflict and arbitration.

165 *Regional Intelligence* (3)

Campbell

Summer 1960.

181 *United States** (3)

Spring—morning.

* See footnote page 285.

- 183 *Western Europe** (3) Davis
Fall—evening.
- 184 *The Mediterranean** (3) Davis
Spring—evening.
- 185 *Africa** (3)
Not offered 1960-61.
- 186 *The Middle East** (3) Campbell
Not offered 1960-61.
- 191 *Latin America** (3)
Not offered 1960-61.
- 195 *Eastern and Southeastern Asia** (3)
Not offered 1960-61.
- 196 *The Soviet Union** (3) Westermann
Fall—morning.
- 197 *The Pacific** (3)
Not offered 1960-61.
- 198 *Australia** (3) Westermann
Not offered 1960-61.

THIRD GROUP†

- 201-2 *Seminar: History and Philosophy of Geography* (3-3) Campbell
A year course: credit is not given for the first half until the second half is completed. Academic year—evening. A study of the development of geographic thought, from Herodotus to the present; a critical appraisal of the great works of the world's most famous geographers; an attempt to develop a useful, contemporary philosophy of geography.
- 205-6 *Area Data Collection and Analysis* (3-3) Davis
A year course: credit is not given for the first half until the second half is completed. Academic year: lecture (1 hour), laboratory and field (3 hours)—evening. Sources of regional information; methods and systems of data collection; quantitative and qualitative methods of analysis; systems of synthesis.
- 211-12 *Reading Course in Economic Geography* (3-3) Westermann, Fischer
Academic year—evening. The development of economic geography as a systematic approach to regional analysis, the literature of economic geography, research methods.
- 233-34 *Seminar: Regional and Urban Planning* (3-3)
Not offered 1960-61. Analysis of the planning function, major problems confronting the planner, contemporary status of planning—its areas of success and failure.

* Regional survey. No prerequisites. For students particularly interested in the study of specific regions, regional courses in the departments of Economics, History, and Political Science are strongly recommended, for example: Economics 185-86, *Economic History and Problems of Latin America*; History 164, *South America since Independence*; and Political Science 177, *Recent Trends in Latin American Politics and Government*.

† Senior major or graduate status is required in all third-group courses.

- 241-42 *Seminar: Place and Culture* (3-3)
Not offered 1960-61. A study of the culture traits which characterize various ethnic groups and differentiate people-place associations.
- 251-52 *Seminar: World Problem Areas* (3-3) Westermann
Not offered 1960-61; summer 1960—Geography 251(3). A study of those parts of the world which have become matters of international concern, whether because of their political or social instability, unsound economic development, or aggressive tendencies. An evaluation of the complex of factors which have created the "problems".
- 295-96 *Research* (3-3) The Staff
Academic year—as arranged. Special directed studies.
- 299-300 *Thesis* (3-3) The Staff

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following courses for students undertaking work toward the degree of Bachelor of Science in Cartography, which is administered by the College of General Studies. For information concerning the degree in Cartography, see the brochure on the subject.

CARTOGRAPHY PROGRAM

Geography

- 113 *Geomorphology* (3)
114 *Weather and Climate* (3)
132 *Land Use* (3)
176 *Photo Geography* (3)

Cartography

- 1 *Map Interpretation* (3)
2 *Photo Interpretation* (3)
11 *Cartographic Drafting and Descriptive Geometry* (3)
12 *Topographic Surveying* (3)
13 *Higher Surveying* (3)
17-18 *Elementary Photogrammetry* (3-3)
110 *Map Projections* (2)
111 *Map Reproductions* (1)
155 *Elementary Geodesy* (3)
156 *Geodetic Astronomy* (3)
191-92 *Map and Chart Construction* (3-3)

GEOLOGY*

Professor Geza Teleki (*Executive Officer*); Professorial Lecturers C. L. Christ, Michael Fleischer, H. T. Evans, Jr.; Associate Professorial

* The Staff of Instruction here listed is for the academic year 1959-60.

Lecturer, I. G. Sohn; Assistant Professor Percy Crosby; Lecturer Irving Friedman

Bachelor of Arts or Bachelor of Science with major in Geology (Columbian College—Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, pages 69 and 70. The following first-group courses must be included: Geology 1-2, 12, 51; Chemistry 11-12; Physics 11, 12; Biology 1-2 or Botany 1-2 or Zoology 1-2.

Required: in addition to the general requirements of Columbian College as stated on pages 81-87, twenty-four semester hours in Geology beyond first-group courses for the Bachelor of Arts degree, thirty for the Bachelor of Science degree.

Master of Arts or Master of Science in the field of Geology (Columbian College).—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Geology from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91.

Note: The Department of Geology has recently been reactivated after a lapse of several years. It is planned, therefore, that as the program develops courses in addition to those listed below will be offered, including geophysics, paleobotany, field geology, pedology, advanced general geology, and graduate work in petrology and sedimentation.

FIRST GROUP

1-2 *Introductory Geology* (3-3)

The Staff

Academic year: lecture (2 hours), laboratory and field trip (3 hours)—morning and afternoon. A survey course covering the principles of geology. *First half*: physical geology—materials of the earth's crust, geologic processes. *Second half*: historical geology, geological periods, evolution of life on earth. Laboratory fee, \$5 a semester.

12 *Minerals and Rocks* (3)

Crosby

Fall: lecture (2 hours), laboratory (3 hours)—morning. Analysis, identification, and classification of minerals and rocks; determinative mineralogy. Prerequisite: Geology 1-2 or permission of the instructor. Laboratory fee, \$7.

51 *Introductory Paleontology and Stratigraphy* (3)

The Staff

Spring: lecture (2 hours), laboratory (2 hours)—morning. Survey of paleontology and stratigraphy, taxonomy of fossil plants and animals, stratigraphic paleontology, principles of sedimentation and correlation. Prerequisite: Geology 1-2 or permission of the instructor. Laboratory fee, \$5.

SECOND GROUP

101 *History of Geological Sciences* (1)

Teleki

Fall—evening. Lectures on the development of geological thought and the history of geological and related sciences.

11-12 *Mineralogy* (3-3)

Crosby

A year course: credit is not given for the first half until the second half is completed. Academic year: lecture (2 hours), laboratory (3 hours)—morning and afternoon. *First half*: morphological crystallography, elements of crystal chemistry, structural basis for classification of minerals with special emphasis on the silicates. *Second half*: optical mineralogy, study of minerals with polarizing microscope. Prerequisite: Geology 1-2, Chemistry 11-12, Physics 11 and 12. Laboratory fee, \$10 a semester.

- 115 *Petrology* (4) Crosby
Fall: lecture (2 hours), laboratory (4 hours)—evening. Introduction to the principles of heterogeneous equilibrium and phase rule, interpretation of phase diagrams, petrogenesis, classification and description of rocks using the polarization microscope. Prerequisite: Geology 111-12; Chemistry 111-12, recommended.
- 122 *Structural Geology* (3) Crosby
Spring: lecture (2 hours), laboratory and field trips as arranged—morning. Interpretation of geologic formations on the basis of their structures and genesis. Principles of mega- and micro-tectonics. Prerequisite: Geology 1-2, Physics 11 and 12.
- 128 *Geomorphology* (3) Teleki
Spring: lecture (2 hours), laboratory and field trips as arranged—afternoon. Nature and evolution of earth forms, interpretation of maps and aerial photographs. Prerequisite: Geology 1-2 or Geography 116.
- 132 *Economic Geology* (3) Crosby
Lecture (2 hours), laboratory and field as arranged. 1960-61 and alternate years: spring—evening. Genesis, distribution, mode of occurrence, and utilization of mineral raw materials. Mining industry in relation to economic life. Laboratory fee, \$10.
- 151-52 *Invertebrate Paleontology* (3-3) Teleki
Academic year: lecture (2 hours), laboratory (3 hours), field trips as arranged—morning. Taxonomy of fossil invertebrates, development of phyla, paleoecology of invertebrate organisms. One or two phyla a semester; does not repeat itself and may be reelected for credit. Prerequisite: Geology 1-2, 51; Biology 1-2 or Zoology 1-2. Laboratory fee, \$8 a semester.
- 154 *Vertebrate Paleontology* (3) Hotton*
Fall: lecture (2 hours), laboratory or field as arranged—evening. General features of vertebrate morphology and evolution as illustrated by the fossil record; problems of paleoecology and adaptation, where appropriate.
- 166 *Stratigraphy* (4) Teleki
1961-62 and alternate years. Sedimentation of facies, evaluation of stratigraphic boundaries, principles of correlation, applied stratigraphic geology. Prerequisite: Geology 1-2, 51.
- 173 *Regional Geology* (3) Crosby
1961-62 and alternate years. Topic: North America. Lecture and map work on the regional distribution of geological formations and structures. This course may be reelected for credit. Prerequisite: Geology 1-2, Geography 51, or permission of the instructor.
- 174 *World Regional Geology* (3) Teleki
Fall—evening. Lecture and map work on the regional distribution of geological formations of the world, with special emphasis on geotectonics and paleogeography. Prerequisite: Geology 1-2, Geography 51, or permission of instructor.

THIRD GROUP

205-6 Seminar† (3-3)

Academic year—as arranged. Special topics. Does not repeat itself and may be elected in successive years.

* Appointment effective September 1960.

† See footnote (*) on page 289.

- 211 *X-ray Crystallography* (3) Christ
Fall—evening. The structure of crystals as determined by the X-ray method.
- 212 *Crystal Chemistry** (3) Evans
Not offered 1960-61. Chemistry of the solid state. Bounding and coordination and the role of crystalline structure in chemistry and mineralogy.
- 241 *Geochemistry** (3) Fleischer
1961-62 and alternate years. Principles and theories on the abundance, relationships, and the distribution in the various rock and mineral species.
- 244 *Isotope Geology** (3) Friedman
1961-62 and alternate years. Investigation of geological phenomena by means of stable and unstable isotopes of elements and of changes in their abundance.
- 251-52 *Micropaleontology* (3-3) Sohn
Lecture (2 hours), laboratory as arranged. 1960-61 and alternate years: academic year—evening. Identification with the binocular microscope of Ostracoda and other fossil micro-organisms. Micropaleontological techniques, paleontological research methods, taxonomy, and paleoecology. Age determination and correlation of stratigraphic units. Laboratory fee, \$12 a semester.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged.

GERMANIC LANGUAGES AND LITERATURES†

Professor W. K. Legner (*Executive Officer*); Associate Professor G. L. Rogers‡; Assistant Professor J. C. King

Bachelor of Arts with a major in Germanic Languages and Literatures (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69.

Required: in addition to the general requirements of Columbian College as stated on pages 81-87. German 51-52 plus eighteen semester hours in German courses above the first group; reasonable proficiency in speaking and writing German; History 39-40 or the equivalent; six semester hours in Philosophy selected with the approval of the adviser. Majors in German are strongly advised to study French.

Master of Arts in Germanic Languages and Literatures (Columbian College).—Prerequisite: a Bachelor of Arts degree with a major in Germanic Languages and Literatures from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91; a reading knowledge of French. The thirty hours of required work must include a thesis in the field of German literature or linguistics

* Prerequisite: an adequate background in physics and chemistry, to be determined in conference with the instructor.

† The Staff of Instruction here listed is for the academic year 1959-60.

‡ On sabbatical leave spring semester 1959-60.

Doctor of Philosophy (Graduate Council).—See page 96.
Bachelor of Arts in Education with a teaching field in German (School of Education).—Prerequisite: the Education curriculum, page 72.
 Required: the German option, page 163 and the professional courses listed on pages 166-67.

FIRST GROUP

1-2 *First-year German* (3-3)

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—morning; summer 1960. *Second half:* fall—morning; spring—morning and evening; summer 1960. The essentials of German grammar; translation of easy prose. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester. The Staff

3-4 *Second-year German* (3-3)

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—morning; summer 1960. *Second half:* fall—morning; spring—morning and evening; summer 1960. Selections from modern German prose; review of grammar. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester. Prerequisite: German 1-2 or two years of high school German. The Staff

9-10 *German Conversation and Composition* (3-3)

Academic year—morning. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester. Rogers

49 *German Readings for Nonmajor Students* (3)

Fall—Saturday morning; spring—evening; summer 1960. Primarily for students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students. Prerequisite: German 4 or the equivalent. Legner

51-52 *Introduction to German Literature* (3-3)

Academic year—evening. Prerequisite: German 4 or the equivalent. Österle*

SECOND GROUP

103-4 *Goethe's "Faust"—Parts I and II* (3-3)

1960-61 and alternate years: academic year—evening. Legner

131-32 *German Literature of the Eighteenth Century* (3-3)

1961-62 and alternate years. The age of Lessing, Goethe, and Schiller. Rogers

141-42 *German Literature of the Nineteenth Century* (3-3)

1961-62 and alternate years. Romanticism, Biedermeier period, Young Germany, and realism. King

151-52 *German Literature of the Twentieth Century* (3-3)

1960-61 and alternate years: academic year—evening. Rogers

* Appointment effective September 1960.

- 179-80 *Advanced Composition for Undergraduate and Graduate Majors* (1-1) King, Legner
Academic year—as arranged.

THIRD GROUP

- 201-2 *Middle High German* (3-3) Legner
1961-62 and alternate years.
- 205-6 *Gothic* (3-3) Legner
1960-61 and alternate years: academic year—evening. Introduction to the comparative study of Germanic languages.
- 209-10 *Old High German* (3-3) King
1960-61 and alternate years: academic year—afternoon.
- 213-14 *Old Norse* (3-3) Allee
1961-62 and alternate years.
- 221-22 *General Linguistics; Comparative and Historical Indo-European Linguistics* (3-3) King
1961-62 and alternate years. *First half*: introduction to linguistics as a science. *Second half*: introduction to comparative and historical linguistics, with special reference to the Indo-European family.
- 223-24 *Linguistic Analysis of Modern German* (3-3)
1962-63 and every third year. Treatment of phonetics, phonemics, morphology, and syntax.
- 225-26 *Seminar: Linguistics* (3-3) The Staff
1962-63 and every third year. Bibliography, methodology, readings and research problems.
- 229 *German Literature of the Fifteenth and Sixteenth Centuries* (3) Legner
1961-62 and alternate years. Transition from chivalric to bourgeois literature. The era of Humanism and of the Reformation as reflected in the principal literary works.
- 230 *German Literature of the Seventeenth Century* (3) Legner
1961-62 and alternate years. Imitation of foreign models. The literary societies. Preciosity. The beginnings of realism in the novel. Pietism.
- 231-32 *German Classicism* (3-3) Rogers
1960-61 and alternate years: academic year—morning. An advanced study and critique of the literature of the Goethezeit. Prerequisite: German 131-32 or the equivalent.
- 241-42 *Seminar: German Romanticism* (3-3) King
1960-61 and alternate years: academic year—as arranged. Treatment of individual writers, groups, motifs, and tendencies.
- 251-52 *Seminar: Studies in Twentieth Century German Literature* (3-3) Rogers
1961-62 and alternate years. Special projects in fiction, drama, poetry, and criticism.

- 261-62 *German-English and German-American Literary Relations and Interactions* (3-3) Österle
Not offered 1960-61. Comparative study of major genres. Appraisal of influences.
- 271-72 *Seminar: German Literature* (3-3) The Staff
1961-62 and alternate years. Bibliography, methodology, readings and research problems.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged. Required of all candidates for the Master's degree in German.

RELATED COURSES IN OTHER DEPARTMENTS

English 223-24 *Old English*
English 225 *Applied Linguistics*

HISTORY*

Professors E. L. Kayser, Wood Gray, H. M. Merriman, R. H. Davison†
(Executive Officer); Associate Professors W. C. Davis‡, R. B. Thompson, R. C. Haskett

Bachelor of Arts with a major in History (Columbian College—Field-of-Study).
—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69. Courses must include History 39-40 and 71-72.

Required: the general requirements of Columbian College as stated on pages 81-87 and the grade of "pass" on the History major examination at the end of the senior year.

The major, centered on the study of the rise, development, and spread, and the continuing challenges of Western civilization, is attested by a major examination. Under the guidance of an adviser the student will arrange his program in History to attain a balanced coverage of (1) the rise of civilization in Europe to the eve of the French Revolution, (2) the spread of Western culture throughout the world since the close of the fifteenth century, (3) the historic problems of modern industrial civilization from the beginnings of the Industrial Revolution, and (4) the relations of the major nations of Europe and America in their world setting since the Napoleonic Wars. A six-hour research seminar to give training in fundamental technics is a required part of each major's program, and a proseminar (History 199-200) is offered as a means of integrating the student's understanding of the continuity of Western civilization. For details relating to the administration and content of the major, see the pamphlet on this subject, which is available in the offices of the Dean of Columbian College and the Executive Officer of the History Department.

Bachelor of Arts with a major in Latin American Civilization (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69.

* The Staff of Instruction here listed is for the academic year 1959-60.

† On leave of absence spring semester 1959-60.

‡ On sabbatical leave spring semester 1959-60.

Required: the general requirements of Columbian College as stated on pages 81-87 and the grade of "pass" on the Latin American Civilization major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined includes political and social history, economic development, governmental structures and international relations, and the principal literary works and writers of the Latin American republics. The Department of History provides a proseminar (History 197-98) intended to assist the student in preparing himself for the major examination. For further details, see the pamphlet, which is available in the Office of the Dean of Columbian College.

Master of Arts in the field of History (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in History from this University, or the equivalent, and the approval of the Department.

Required: the general requirements of Columbian College, as stated on pages 88-91. Of the twenty-four semester hours of required second- and third-group courses (exclusive of the thesis), at least six must be in third-group history courses; a maximum of six may be in a closely related field outside the Department of History as approved by the Department. Master's candidates are responsible for arranging with instructors of second-group courses for extra work, in order to receive graduate credit for such courses.

Master of Arts in the field of Latin American Civilization (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Latin American Civilization from this University, or the equivalent.

Required: the general requirements of Columbian College, as stated on pages 88-91. Course work and the comprehensive examinations will embrace political and social history, governmental structures and international relations, economic development, and principal literary works of Latin America. The thesis may be written in any one of these four fields. All courses must be approved in advance by the Adviser.

Doctor of Philosophy (Graduate Council).—See page 96.
Bachelor of Arts in Education with a teaching field in History (School of Education).—Prerequisite: the Education curriculum, page 72.

Required: the History option, page 163, and the professional courses listed on pages 166-67.

FIRST GROUP

39-40 *The Development of European Civilization (3-3)*

Kayser, Davison

Academic year—morning and evening; summer 1960. Primarily for freshmen. *First half:* the political, social, economic, and cultural history of the Old World from ancient times to 1715. *Second half:* from 1715 to the present.

71-72 *The Development of the Civilization of the United States (3-3)*

Haskett

Academic year—morning and evening; summer 1960. Primarily for sophomores. *First half:* the political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. *Second half:* from 1865 to the present.

SECOND GROUP*

109 *Intellectual History of the Western World I: the Classical World (3)*

Kayser

Not offered 1960-61.

* History 39-40 is prerequisite to courses 109 through 152 and 190 through 196; History 71-72, to courses 171 through 184; either History 39-40 or 71-72, to courses 161 through 166.

- 110 *Intellectual History of the Western World II: the Middle Ages and Renaissance* (3) Kayser
Not offered 1960-61.
- 119 *Intellectual History of the Western World III: from the Reformation through the Age of Reason* (3) Kayser
Not offered 1960-61.
- 120 *Intellectual History of the Western World IV: Intellectual Aspects of the Modern Age* (3) Kayser
Not offered 1960-61.
- 130 *Nationalism* (3) Kayser
Summer 1960. The historical evolution of modern nationalism.
- 131-32 *History of Germany* (3-3)
Academic year—morning. The political, social, and cultural development of the German people. *First half:* from the Reformation to 1871. *Second half:* from 1871 to the present.
- 141-42 *History of France* (3-3)
Not offered 1960-61. A general survey of the political, social, and cultural development of France. *First half:* from earliest times to 1789. *Second half:* from 1789 to the present.
- 143-44 *History of Old Russia* (3-3) Thompson
1961-62 and alternate years; summer 1960—History 143 (3). A thousand-year political and cultural survey of Eastern Europe. *First half:* the roots of Eurasian empire before Peter the Great, 862-1682. *Second half:* the "schism of the Russian soul" in the Golden Age, 1682-1881.
- 145-46 *History of New Russia* (3-3) Thompson
Academic year—morning. Twentieth century Russia in its liberal, revolutionary, and totalitarian phases. *First half:* Bolshevism's road to power in the Lenin Era, 1881-1921. *Second half:* the politics of empire in the Stalin Era, 1921-1953.
- 147 *Economic History of Europe* (3) Gray
Fall—morning. A survey from ancient times to the present day.
- 148 *Oversea Expansion of Europe* (3)
Not offered 1960-61. International rivalries and the impact of European civilization in Africa and the Pacific basin since 1500, with emphasis on the 19th and 20th centuries.
- 149-50 *European Diplomatic History* (3-3) Davison
First half: 1961-62 and alternate years. *Second half:* spring—morning. Background of the European state system and of diplomatic practices and relations since the Congress of Vienna, with emphasis on the policies and actions of the great powers and their statesmen. *First half:* to 1878. *Second half:* since 1878.
- 151-52 *English History* (3-3)
Not offered 1960-61. A general survey of the development of political, social, and economic institutions of lasting significance in the English speaking world. *First half:* to 1689. *Second half:* since 1689.

- 161 *Ancient Americans* (3) Davis
1960-61 and alternate years: fall—morning. A study of the Maya, Aztec, Inca, and other early civilizations of North and South America.
- 162 *Iberian Background of Latin America* (3) Davis
1960-61 and alternate years: spring—morning. History of Spain and Portugal, with emphasis on developments leading to the rise and decline of the Spanish and Portuguese empires.
- 163 *Colonial Latin America* (3) Davis
Fall—evening. Political, economic, social, and institutional developments in Spanish and Portuguese America from the conquest through the wars of independence.
- 164 *South America since Independence* (3) Davis
Alternate spring and summer terms: summer 1960; spring 1961—evening. Development of the independent South American states in the 19th and 20th centuries.
- 166 *Mexico and the Caribbean since Independence* (3) Davis
Alternate spring and summer terms: summer 1961; spring 1962. A survey of the republics of Mexico, Central America, and the Caribbean islands.
- 170 *American Colonial History* (3) Haskett
Not offered 1960-61. The settlement of the British colonies, the development of provincial institutions, and the emergence of an American civilization in the 17th and 18th centuries.
- 171-72 *Social History of the United States* (3-3) Gray
Academic year—evening; summer 1960—History 172 (3). Daily life, institutions, intellectual and artistic achievements of the Agrarian Era, 1607-1861; and the Urban-Industrial Era, 1861 to the present time.
- 173 *Representative Americans* (3) Gray
Spring—morning; summer 1960. A biographical approach to national history. Some fifty significant and pivotal personalities in the development of the United States in government, business, science, religion, journalism, the arts, and social reform.
- 174 *Economic History of the United States* (3) Gray
Spring—morning. Main trends in the development of American agriculture, industry, and trade since 1607, with emphasis on tendencies and problems since the Civil War.
- 175-76 *Political and Constitutional History of the United States* (3-3) Haskett
Academic year—morning; summer 1960—History 176 (3). The programs and conflicts of group interests in America within the political and legal framework. *First half*: to the eve of the Civil War. *Second half*: the Civil War to 1940.
- 177 *The South* (3) Gray
Fall—morning. Rise of the plantation system and slavery; the intersectional conflict; and the problems and progress of the New South.
- 178 *The West* (3)
Not offered 1960-61. The role of the frontier in American history.

- 181-82 *Diplomatic History of the United States* (3-3) Merriman
Academic year—morning and evening; summer 1960—History 181 (3).
Tendencies toward isolation, expansion, and collectivism; disputes with foreign
countries and their settlement; and the activities of the American secretaries of
state and diplomatic agents. *First half*: to 1898. *Second half*: since 1898.
- 183 *Oversea Expansion of the United States* (3) Merriman
Spring—morning. The political, economic, social, and cultural life of our
outlying possessions.
- 184 *Canada and the United States* (3) Merriman
Not offered 1960-61. The historical background and main trends in the re-
lationship of the two English-speaking peoples of North America.
- 190 *History of India* (3) Thompson
Not offered 1960-61. The civilization of India and her neighbors from the
beginnings to independence.
- 191-92 *Current History* (1-1) Kayser
Academic year—afternoon. Contemporary events in their world setting.
- 193 *History of the Near East* (3) Davison
1960-61 and alternate years: fall—evening. The Byzantine, Arab, Persian,
and Islamic backgrounds of Near Eastern history; the rise and decline of the
Ottoman Empire; the action of European powers in the area; and the Ottoman
breakup into the Turkish Republic and other successor states.
- 195-96 *History of the Far East* (3-3) Thompson
Academic year—evening. *First half*: the civilization of China and Japan
from the beginnings to 1600. *Second half*: the modern Far East under the
impact of the West since 1600.
- 197-98 *Proseminar in Latin American Civilization* (3-3) Davis, Robb
Academic year—as arranged. Reading course for coordination and review.
Open only to majors in Latin American Civilization.
- 199-200 *Proseminar: Readings for the History* Thompson
Major (3-3)
Academic year—evening; summer 1960. Limited to majors in History.
Readings and discussions on main trends in the history of Western civiliza-
tion, including representative selections from the classics of historical literature.

THIRD GROUP*

- 241-42 *Seminar in Modern European History* (3-3) Davison
Academic year—evening.
- 243 *Reading Course in Modern European History* (3) Thompson
Fall—as arranged. Primarily for graduate students.
- 246 *Seminar in Eurasian History* (3) Thompson
Spring—evening.
- 247 *Reading Course in Eurasian History* (3)
Fall—as arranged. Primarily for graduate students.

* Approval of the instructor is required for registration in each third-group course.

- 249 *Seminar in European Diplomatic History* (3) Davison
Fall—afternoon.
- 261-62 *Seminar in Latin American History* (3-3) Davis
1961-62 and alternate years.
- 271-72 *Seminar in the Social History of the United States* Gray
(3-3)
Academic year—evening.
- 275-76 *Seminar in American Political and Constitutional History* Haskett
(3-3)
Academic year—evening.
- 277 *Reading Course in American Political and Constitutional History* (3) Haskett
Fall—as arranged. Primarily for graduate students.
- 281-82 *Seminar in the Diplomatic History of the United States* (3-3) Merriman
First half: not offered 1960-61. Second half: spring—afternoon.
- 285-86 *Reading Course in American Diplomatic History* (3-3) Merriman
Not offered 1960-61. Primarily for graduate students.
- 291-92 *Seminar* (3-3) The Staff
Academic year—as arranged; summer 1960. Prerequisite: approval of the Department.
- 294 *Seminar in the History of the Modern Near East* (3) Davison
Spring—evening
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1960. Required of all candidates for the Master's degree specializing in history.

HOME ECONOMICS*

Professors Frances Kirkpatrick (*Executive Officer*), K. M. Towne

Bachelor of Science with a major in Home Economics (School of Education).—Prerequisite: the Home Economics curriculum in the Junior College, see page 73. The requirements for the degree are stated on pages 157-58 and 167.

Bachelor of Arts in Education with a teaching field in Home Economics (School of Education).—Prerequisite: the Education curriculum on page 72.

Required: the Home Economics option, page 164 and the professional courses listed on pages 166-67. (See also special bulletin.)

* The Staff of Instruction here listed is for the academic year 1959-60.

FIRST GROUP

- 1 *Food Selection and Preparation* (3) Kirkpatrick
Fall—morning. Composition, selection, and preparation of food; analysis of recipes; standard products; planning, preparing, serving, and estimating the cost of meals. Material fee, \$18.
- 22 *Clothing: Its Selection, Cost, and Care* (3) Towne
Spring—morning. Clothing selections—the economic, aesthetic, and hygienic aspects; the application of the principles of color and design to individual selection; the care of clothing.
- 51 *Family Meals* (3) Kirkpatrick
Spring—morning. The choice, purchase, preparation, and service of foods; dietary standards, food habits, and the nutritional needs of the family; problems of purchasing, care, and use of food by the consumer. Material fee, \$11.
- 53 *Family Health and Household Sanitation* (3) Kirkpatrick
Fall—evening. Home hygiene and home care of the sick; the principles of household sanitation in relation to health and diseases.
- 62 *Clothing Construction* (3) Towne
Fall—evening; spring—afternoon. Simplified techniques and unit method of construction suitable for cotton, wool, silk, and man-made fibers; the use of commercial patterns and their alteration; the proper selection of color, design, and fabric. Material fee, \$8.
- 66 *Fabric Decoration* (3) Towne
Fall: lecture (1 hour), laboratory (4 hours)—afternoon. Original pattern and color combinations; application to a variety of hand methods of decorating fabrics for use as clothing, draperies, and upholstery; use of stencils, block and screen printing, and other simple equipment.
- 71 *Costume Design and Fashion Economics* (3) Towne
Spring—evening. Factors determining fashions and effect on cost of clothing, problems of the consumer of textiles and clothing, historic costume and its relation to modern dress. Material fee, \$8.
- 72 *Household Textiles* (3) Towne
Not offered 1960-61. Properties, uses, and tests of the different textile fibers and fabrics, and development of judgment and knowledge of standard for the consumer of clothing and house-furnishing material. Material fee, \$8.
- 77 *Marketing* (3)
Not offered 1960-61. Purchasing of foods as it relates to the home and to the institution.

SECOND GROUP

- 102 *Advanced Food Preparation* (3) Kirkpatrick
Fall—morning. The application of the fundamental processes of food preparation to a wider range of food materials and various services for different occasions. Material fee, \$18.
- 106 *Quantity Cookery* (3)
Not offered 1960-61.
- 123 *Household Finance and Problems of the Consumer* (3) Towne
Not offered 1960-61. Economic problems of the family in modern industry.

- trial society, family income, income apportionment and household expenditures, laws affecting the home, investments, consumer buying.
- 143 *Advanced Clothing Construction* (3) Towne
Fall—afternoon. Problems of clothing construction and flat pattern designing. Material fee, \$8.
- 148 *Food Problems and Demonstration Methods* (3) Kirkpatrick
Not offered 1960-61. Factors affecting the preparation of standard products from the experimental viewpoint, principles of demonstration. Material fee, \$18.
- 152 *Nutrition* (3) Kirkpatrick
Spring—morning. Lecture course on the principles of normal and abnormal human nutrition. Laboratory work on the calculation and preparation of diets. Laboratory fee, \$8.
- 154 *Diet Therapy* (3)
Not offered 1960-61. Study of nutrition as applied to diet and disease. Material fee, \$8.
- 164 *Child Nutrition* (3) Kirkpatrick
Spring—evening. Basic principles and practices in nutrition at infant, pre-school, and adolescent ages. Demonstration of nutritional and special food requirements.
- 168 *Institutional Management* (3)
Not offered 1960-61. Study of the organization, equipment, and marketing problems of institutions.
- 171 *House Furnishing* (3) Towne
Fall—morning. Home planning from the historic, artistic, economic, and sanitary viewpoints; home furnishings such as linens, dishes, floor covering, mattresses, etc. Material fee, \$5.
- 172 *Problems in Home Furnishings* (3) Towne
Spring: lecture (1 hour), laboratory (4 hours)—afternoon. Workshop-type course in home furnishings, including upholstering, slip covering, refinishing furniture, and making draperies.
- 181 *The Child in the Home* (3) Kirkpatrick
Not offered 1960-61. Care and development of children, parent-child relationships.
- 192 *The Home, Its Management and Equipment* (3) Kirkpatrick
Spring—afternoon. Economic management of the home; distribution of time and energy; problems in the selection, arrangement, and care of equipment.
- 193 *Supervision of Home Management* (3) The Staff
Fall—as arranged. Field work under supervision. Designed to meet requirements of those preparing to teach in federally aided schools.
- 195-96 *Special Problems* (3-3) The Staff
Academic year—as arranged. Individual investigation or study under the guidance of a member of the Staff; such problems as marketing, draping, and tailoring.

197-98 *Proseminar* (3-3)

The Staff

Academic year—evening.

The study of the most recent materials and problems in the various phases of home economics.

JOURNALISM*

Professor R. P. Schlabach, Jr. (*Executive Officer*); Associate Professor R. C. Willson; Lecturers F. L. Dennis, J. V. Hinkel, Louis Robinson, L. R. Stockstill, J. E. Eisen

Bachelor of Arts with a major in Journalism (Columbia College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69, including English 51-52 or 71-72, History 71-72, Political Science 9-10, and Journalism 71-72.

Required:

- (1) The general requirements of Columbia College, as stated on pages 81-87.
- (2) Twenty-four hours of second-group courses in Journalism as follows: (a) Journalism 111, 196, 198; (b) nine hours chosen from Journalism 121, 133, 137, 144, 151; (c) six hours chosen from Journalism 115, 140, 142, 143, 145.
- (3) Twelve hours of second-group courses, chosen in consultation with the major adviser, in one other department of Columbia College. Students selecting science may take courses in more than one department.

FIRST GROUP

71-72 *Journalism in American Society* (3-3) Schlabach, Willson
Academic year—morning and evening. Evolution of newspapers and other media in relation to political, social, and economic life; the concept of press freedom; problems of contemporary journalism.

SECOND GROUP

111 *Reporting* (3)

Schlabach

Fall—afternoon; spring—evening. Instruction and classroom practice in gathering, evaluating, and writing news; emphasis on newspapers, other media considered.

115 *Editing and Make-up* (3)

Fall—evening. Editing of news and other material for publication, typography and display; use of pictures and other graphic presentations.

121 *Advanced Reporting: Magazine Feature Articles* (3)

Willson

Fall—evening; spring—morning. Instruction and practice in writing magazine articles, material for which is obtained through independent investigation.

133 *Advanced Reporting: Community News* (3)

Eisen

Fall—morning. Instruction and practice in coverage and writing of local news.

137 *Advanced Reporting: National Affairs* (3)

Stockstill

Spring—afternoon. Instruction and practice in coverage and writing of federal government news from the point of view of the press association.

* The Staff of Instruction here listed is for the academic year 1959-60.

- 140 *Pictorial Journalism* (3) Robinson
Fall—evening. Photographic techniques affecting publication, the illustration and the story angle, standards of judgment in selection and use of pictures, captions, editing techniques, cropping for effective reproduction.
- 142 *Retail Newspaper Advertising* (3) Robinson
Spring—evening. Retail newspaper advertising management, coordination of newspaper advertising with retail sales patterns, advertising readership, copy preparation, production methods.
- 143 *Industrial Communications* (3) Willson
Fall—evening. An introduction to the field of corporate journalism. Writing and editing the employee magazine. Preparation of annual reports. Editing stockholder publications, and external house organs.
- 144 *Advanced Reporting: the Arts and Sciences* (3) Willson
Spring—evening. Instruction and practice in writing articles for publication in such fields as the arts, business and economics, science, and technology.
- 145 *Principles and Problems of Public Relations* (3) Hinkel
Fall—Saturday morning. Principles, problems, and ethics of public relations for government agencies, commercial establishments, educational and other public institutions. Case histories of successful programs.
- 151 *Editorial Writing* (3) Schlabach
Fall—afternoon. Instruction and practice in writing of editorials on public affairs.
- 196 *Seminar* (3) Schlabach
Spring—Saturday morning. For Journalism majors only. Research in areas relating journalism to secondary fields of study.
- 198 *Law of the Press* (3) Dennis
Spring—evening. Freedom of the press, censorship, legislative controls, publications as contempt of court, copyright, news gathering agencies, labor law and the newspaper business, law of libel, privileged matter, fair comment on public characters, right of privacy.

LAW*

Professors W. T. Fryer, C. D. Benson, J. F. Davison, O. S. Colclough, L. S. Merrifield, H. I. Orentlicher, O. H. Walburn, D. B. Weaver, L. H. Mayo, G. E. Weston†, R. M. Cooper, W. T. Mallison, Jr., C. B. Nutting; *Adjunct Professors* J. W. Jackson, F. H. Myers; *Professorial Lecturers* J. A. McIntire, J. L. Edgerton, P. F. Herrick, G. E. Monk, C. J. Zinn, Joseph Dach‡, L. J. Harris, J. J. Czyzak, L. P. Walsh, E. A. Beard; *Associate Professors* R. G. Dixon, Jr., J. R. Hambrick; *Associate Professorial Lecturers* P. A. Rose, H. J. Liebesny, T. H. Brown, P. J.

* The Staff of Instruction here listed is for the academic year 1959-60.
† On sabbatical leave spring semester 1959-60.
‡ On leave of absence 1959-60.

Federico, G. J. Goldsborough; *Assistant Professors* G. A. Ledakis, M. H. Freedman, W. J. Baker, J. J. McAvoy, R. J. Temple; *Lecturers* W. W. Goodrich, Vincent Kleinfeld, N. E. Allen, M. F. Cohen, S. S. Cohen, R. C. Nash, Jr., H. N. Williams, J. B. Evans, H. P. Green, Ephraim Jacobs, E. F. Mullin, Jr., J. A. O'Connell, G. W. Shelhorse, Martin Thaler; *Clerk of the Trial Practice Court* J. A. Kendrick; *Associate Clerk of the Trial Practice Court* D. G. Skinker

Special Lecturers K. B. Frank, Alfred Hantman, S. J. L'Homedieu, Jr., A. L. Stevas

For the requirements for the degrees of *Bachelor of Laws*, *Juris Doctor*, *Master of Laws*, *Master of Comparative Law*, *Master of Comparative Law (American Practice)*, and *Doctor of Juridical Science*, see pages 121-24, 125-26.

FIRST YEAR

100 *Agency* (2)

Fall—morning and evening; summer 1960. Master and servant (status of agent), respondeat superior, nature of agency relation, actual authority, parties (disclosed and undisclosed principal), unauthorized transactions, notice, notification.

Cooper, Mullin

110 *Constitutional Law* (4)

Spring—morning and evening. Basic principles of American constitutionalism; judicial function in constitutional cases; implementation of doctrines of separation of powers, federalism, limited government; development and exercise of national powers; introduction to civil rights and liberties.

Dixon

115-16 *Contracts I-II* (4-2)

Academic year—morning and evening; summer 1960. Legal remedies of contracting parties, including damages in contract and quasi-contract, specific performance, reformation, rescission, and remedies in tort; acts creating and terminating contractual rights, including offer and acceptance, mistake, and problems of proof; the function of consideration; third party beneficiaries; assignments; the effect of changed circumstances.

Mayo, Freedman, Allen, Shelhorse

125 *Criminal Law and Procedure* (4)

Spring—morning and evening. Origin and purposes of criminal law; elements of criminal liability; mental disorders; solicitation, attempt, and conspiracy; crimes against the person, against property, and against both; statutory offenses; criminal procedure, with consideration of Federal Rules of Criminal Procedure.

Cooper, Baker, L'Homedieu

135 *Legal Method and Legal System* (4)

Fall—morning and evening; spring—morning and evening; summer 1960. Introduction to substantive and procedural law dealing with basic concepts; training in method and technique of case law and legislation using modern

Fryer, Benson, Orentlicher, Merrifield, Goldsborough, Evans

case records; practice in use of law books and in legal writing; importance of language in law; legal reasoning and use of precedents under doctrines of stare decisis, law of the case, and res judicata; development of Anglo-American legal system; organization of judiciary and bar, stressing enforcement of ethical standards.

- 145 *Personal Property* (2) Fryer, Dixon, Mallison, McAvoy, Nash
Fall—morning and evening; spring—evening; summer 1960. Concepts of property, including interests created by bailments, liens, and pledges; methods of acquiring ownership.

- 150 *Real Property* (4) Benson, Walburn, Ledakis, Baker
Fall—evening; spring—morning; summer 1960. Historical background of the law of estates and conveyancing; types of estates; dower and curtesy; landlord and tenant relationship; concurrent estates; future interests at common law and after the Statute of Uses; the Rule against Perpetuities; incidents of divided ownership, as waste; natural rights; zoning and other land controls.

- 160 *Torts* (4) Merrifield, Walburn, Temple
Fall—morning; spring—morning and evening; summer 1960. Liability for harm to persons or tangible things; defamation and invasion of privacy.

SECOND YEAR

- 202 *Administrative Law* (4) Davison
Fall—evening; spring—morning; summer 1960. The position of the administrative process in the separation of powers, including the status of administrative personnel, administrative hearings, judicial scrutiny of administrative action, discretion, and rule-making—particularly as relating to federal administrative agencies.

- 205 *Brief Writing and Oral Argument* (2)
Not offered 1960–61. Exposition and study of the basic techniques of written and oral legal argumentation. Each student will be required to write, as a term paper, a brief presenting contentions based on the actual record in an unargued case.

- 210 *Business Associations* (4) Weaver, McAvoy
Spring—morning and evening. Contrast of the partnership and corporation as alternative forms of organization; organizing partnerships and corporations—formalities, capital contributions, share structure; problems of operation; relations between partners; roles of shareholders, directors, officers; control devices; distributions to owners; voluntary reorganization; dissolution and termination.

- 215 *Civil Procedure* (4) Walburn, Temple, Thaler
Fall—morning and evening; summer 1960. Pleadings, discovery, joinder, forms of trial and related proof problems. Emphasis is on Federal Rules of Civil Procedure and other modern codes.

- 219 *Commercial Paper* (4) Orentlicher, Ledakis
Fall—morning and evening; summer 1960. Bills of exchange, promissory notes and checks, especially under the Negotiable Instruments Law.

- 224 *Commercial Transactions* (4) Ledakis
Spring—morning and evening. The law relating to the sale and distribution of goods, and to the security financing devices utilized in this connection, with particular attention to the effect of uniform laws.

- 230 *Conveyances* (2) Benson, Walburn, Baker
Fall—morning and evening; spring—evening; summer 1960. Conveyances, recording; easements, profits, covenants, and equitable servitudes; adverse possession and adverse user.
- 235 *Domestic Relations* (2) Potts*, Williams
Fall—morning and evening; summer 1960. Marriage, annulment, and divorce; adoption and custody of children; economic relations.
- 240 *Evidence* (4) Fryer, Weston
Spring—morning and evening; summer 1960. Functions of court and jury; qualifications and examination of witnesses; opinion, relevancy, and scientific evidence; proof of writing; application of the hearsay rule.
- 243 *Federal Jurisdiction* (2) Cooper
Fall—morning and evening. Constitutional and statutory origins of federal courts, cases arising under the laws and the Constitution, diversity of citizenship, jurisdictional amount, removal procedure and jurisdiction, limitations on federal jurisdiction, state and federal conflicts, substantive law applied by federal courts.
- 251 *Insurance* (2) Czyzak
Fall—evening; summer 1960. The insurance device in life, property, and other risks.
- 254 *International Law and World Order* (4) Mallison
Fall—morning and evening. Traditional content of course in international law presented in context of values and institutions of the world community; formal prescription and effective practice concerning participants in decision-making processes; roles of individuals, international public organizations, political parties, pressure groups, private associations, and national states.
- 259 *Labor Law* (4) Merrifield
Spring—morning and evening. Law governing labor-management relations, organization and representation of employees, regulation of economic weapons, enforcement of collective bargaining agreements, interunion and intraunion relations.
- 265 *Law and Accounting* (2) Hambrick, S. Cohen
Fall—morning; spring—evening; summer 1960. Introduction to elementary techniques and principles of financial accounting, relevance of accounting judgments to legal problems, legal judgments involved in problems affected by accounting principles and practice.
- 270 *Legislation* (2) Fryer, Mallison
Spring—morning and evening; summer 1960. The legislative process and roles of various participants in the process; operation of the United States Congress and state legislatures, including fact finding, organization, and procedure; problems of statutory interpretation.
- 274 *Taxation—Federal Estate and Gift* (2) Hambrick
Fall—morning and evening. A survey of the substantive provisions of the federal estate and gift tax laws, including inter vivos transfers, transfers in contemplation of death, joint interests, life insurance proceeds, property subject to powers of appointment, the marital deduction and split gifts; tax procedure.
- 279 *Taxation—Federal Income* (4) Hambrick, Weaver
Spring—morning and evening; summer 1960. Survey of substantive provisions of federal income tax, including concept of gross income, limitations on

* Appointment effective July 1960.

allowable deductions, problems of capital gains taxation, nontaxable exchanges of property, basis problems, provisions affecting the taxation of the family, and principles of income tax accounting.

285 *Trusts and Estates* (4)

Weaver, McAvoy

Fall—morning and evening; summer 1960. Formalities of execution of wills; problems of construction, revocation, contest; limits on testamentary power; intestate succession. Creation of trusts, inter vivos and testamentary; administration of decedents' estates and trust estates.

295 *Unfair Trade Practices* (4)

Weston

Fall—morning and evening. Unfair trade practices at common law and under statutes; trade-marks, trade names; copyright law; misappropriation of ideas; protection of competitors and consumers against false advertising under Federal Trade Commission Act; resale price maintenance under state Fair Trade Acts; miscellaneous business practices.

THIRD YEAR

302 *Admiralty* (2)

Spring—evening. Federal and state jurisdiction; jurisdiction over waters, craft, contracts, torts, crimes, in equitable matters, etc.; laws applicable to maritime workers and maritime liens.

307-8 *Comparative Law I-II* (2-2)

Davison

First half: fall—morning and evening. Second half: spring—evening. The Civil Law System; general introduction to foreign law as exemplified by Roman Law and the French and German Civil Codes; comparative study of administration of justice and legal institutions. *Comparative Law I* may be taken independently of *Comparative Law II*.

309 *Conflict of Laws* (4)

Dixon

Fall—morning and evening; summer 1960. Legal problems arising from occurrences transcending state or national boundaries; jurisdiction; foreign judgments; constitutional influences; theoretical bases of choice of law principles and their application to specific fields, including torts, contracts, property, family law, administration of estates, and business associations.

313 *Constitutional Interpretations* (2)

Dixon

Not offered 1960-61. Advanced course in constitutional law. The Constitution and constitutional tradition, process of judicial decision-making, significance of "due process", current constitutional developments, adequacy of the traditional system of powers and limitations, introduction to comparative constitutional law.

318 *Creditors' Rights* (4)

Ledakis

Summer 1960. Remedies of unsecured creditors; judgments, fraudulent conveyances, creditors' agreements, equity and statutory receiverships, and bankruptcy. The general approach is that of law administration.

321-22 *Current Decisions* (2-2)

Weston, Freedman

Academic year—morning and evening. Required of, and limited to, members of the student staff of the *Law Review*.

330 *Federal Antitrust Laws* (4)

Weston

Spring—evening. Restraints of trade at common law and under Sherman Antitrust Act of 1890, Federal Trade Commission and Clayton Acts by mergers,

monopolies, price-fixing agreements, trade associations, exclusive-dealing agreements, tie-in sales, and trade boycotts; patents and copyrights under antitrust laws.

335 *Jurisprudence* (2)

Mayo

Fall—evening; spring—morning History of jurisprudence; schools of jurists, particularly the nineteenth century schools; sociological jurisprudence; theories of justice; the nature of law; law and morals; law and the state; the scope and subject matter of law; sources and forms of law; the traditional element; analysis of general legal concepts.

339 *Collective Bargaining and Labor Arbitration* (2)

Merrifield

Fall—evening. The collective labor agreement: its content, negotiation, and administration through the grievance procedure and arbitration; problems in the settlement of labor disputes.

341 *Labor Standards and Social Security Legislation* (2)

Merrifield

Not offered 1960-61. Legal problems arising under federal and state statutes dealing with labor standards and social security. Particular emphasis is placed upon the regulation of wages and hours, workmen's compensation, and insurance against unemployment and old age.

345 *Legislative Drafting* (2)

Zinn

Fall—evening. Advanced instruction and practice in legislative drafting.

349 *Local Government Law* (2)

Mallison

Spring—evening. The decision-making processes in metropolitan and local communities; types and objectives of city, county, and special function local government units; intergovernmental relations; original organization and changes; local lawmaking; community planning and development.

355 *Mortgages* (2)

Orentlicher

Summer 1960. Security interests in real property, their creation, transfer, enforcement, and extinguishment.

359 *Patent Law I** (2)

O'Connell

Fall—evening. Origin and nature of patents, patentable subject matter, classes of patents, novelty, utility, invention, patent claims and their interpretation, acts constituting infringement, correction of patents.

360 *Patent Law II* (2)

Harris

Spring—evening. Lectures and discussion; licensing and protection of industrial property; uses and abuses of patents; governmental regulation; protection abroad; economic and social functions of patents, trade-marks, and copyrights. Prerequisite: Law 359.

362 *Patent Office Practice** (2)

Rose

Spring—evening. Rules and practice; appeal and interference procedure.

365-66 *Patent Trial Practice Court** (2-2)

Brown, Federico

Academic year—evening. Practice before the United States Court of Customs and Patent Appeals and the federal courts. Prerequisite: forty-two semester hours, including Law 215 and 240. Law 359, which is also required, may be taken concurrently. This course may be elected instead of Law 385-86 to satisfy the Trial Practice Court requirement.

* Patent law students may take Law 359 and Law 365 concurrently in the fall semester and Law 362 and Law 366 concurrently in the spring semester.

- 370 *Public Utilities* (2) Fryer
Fall—evening. Regulation by federal, state, and municipal authorities concerned with licensing, rates, services, and practices, with emphasis on federal regulation of interstate operations; judicial review.
- 376 *Restitution* (2) Orentlicher
Spring—morning and evening; summer 1960. Remedies at law and in equity for restitution of benefits conferred, especially as based on the concept of unjust enrichment.
- 380 *Suretyship* (2) Orentlicher
Summer 1960. The law of suretyship, especially in the context of accommodation credit and commercial and financial practices, with attention also to informal and nonconsensual suretyship relations and the place of suretyship principles in the solution of legal problems generally.
- 385-86 *Trial Practice Court* (2-2) Jackson, Myers, Edgerton, Herrick, Monk, Walsh, Beard, Kendrick, Skinker
Academic year—morning and evening. Trial of assigned cases; trial tactics and techniques; pre-trial and court room procedures pursuant to Federal Rules. To be taken in the senior year. Prerequisite: forty-two semester hours, including Law 215 and 240.
- 391 *United Nations Constitutional Law* (2) Mallison
Spring—evening. Structure and process of decision of the United Nations—the peaceful settlement of disputes, collective security, regulation of armaments, regional arrangements, and types of functional cooperation.

GRADUATE COURSES

- 401 *Administrative Law Seminar* (2) Davison
Spring—evening. Group study of specific problems in administrative law.
- 408 *Constitutional Law Seminar* (2) Dixon
Spring—morning. Group study of contemporary problems in constitutional law.
- 412 *Control and Use of Atomic Energy* (2) Mayo
Spring—evening. Various legal problems involved in the control and use of atomic energy will be examined, including the Atomic Energy Act, the policy underlying the present government monopoly, the security problem of safeguarding atomic military information, the implications in prospective industrial control and use, and legal means of protecting personal interests against the possible consequences of atomic warfare.
- 416 *Criminal Practice and Administration* (2) Cooper
Spring—as arranged. Group study of the fundamental aspects of criminal procedure with special reference to practice before the District of Columbia and federal courts; the law of arrest, searches and seizures, self-incrimination, the function of the preliminary examination and grand jury, sufficiency of indictments, trial procedure, and the order of pleas and motions. Advance registration, limited to fifteen students.

420 *Estate Planning Seminar* (2)

Weaver

Spring—evening. Group study of the effective disposition of wealth, inter vivos and testamentary gifts, conservation for owner's future use, use of insurance, tax and administrative problems, business interests, pension and profit-sharing arrangements.

424 *Evidence and Trials Seminar* (2)

Fryer

Fall—evening. Study of selected problems involving presentation of documentary proof and expert testimony in connection with the reforms sought by the Uniform Rules of Evidence and recent developments in the field of forensic medicine.

428 *Food and Drug Law* (2)

Goodrich, Kleinfeld

Spring—evening. A lecture and discussion course dealing with the Federal Food, Drug, and Cosmetic Act and governmental controls thereunder. Both government and industry viewpoints are considered.

431 *Government Contracts I* (2)

McIntire

Fall—evening. A consideration of the basic power of the Federal Government to enter into contracts; the nature and construction of such contracts; normal and war or defense powers aspects of government procurement, including administrative and legislative policy and procedures; forms of contracts; standard clauses; advertised bid procedure problems; negotiated contracts; modification of contracts; remedies on contractual claims.

432 *Government Contracts II* (2)

McIntire

Spring—evening. Special problems in government contracts, including adjustments and relief; procedure for prosecuting claims under government contracts; attempts at price, cost, or profit control; termination. Prerequisite: Law 431.

442 *Labor Law Seminar* (2)

Merrifield

Fall—evening. Group study of contemporary problems in labor law.

449 *Law of the Near East* (2)

Liebesny

Not offered 1960-61. A study of the law of the Arab countries, including the basic principles of the Islamic law, an analysis of the present day codes, and an investigation of the Western influences on the laws of the Arab countries.

455 *Legal Problems in Modern Methods of Warfare* (2)

Mallison

Not offered 1960-61. The contemporary international law of war: legal aspects of modern methods of coercion (economic, political, psychological, and military); regulation of hostilities; the special problems of atomic, biological, and chemical weapons; war crimes.

459 *Military Law and Jurisdiction* (2)

Mayo

Not offered 1960-61. Sources of military jurisdiction; military law proper, including court-martial jurisdiction and procedures before, during, and after trial; military government; martial law; laws of war and treatment of offenders.

463 *Regulation of Communication Media* (2)

Mayo

Fall—evening. An examination of the legal doctrine relating to regulatory practices in the channels of mass communications, i.e., newspapers, motion pictures, and radio-television; analysis of the operational structure of the mass media and the pattern of control exercised by government, private associations, and various community groups; appraisal of the comparative utility of

various regulatory techniques for implementing policies affecting these media; special emphasis will be placed on the functions of the Federal Communications Commission.

- 466 *Regulation of Securities and Securities Markets* (2) M. Cohen
Fall—evening. A study of state and federal laws governing the offering and distribution of securities to the public by corporate issuers and others, the regulation of securities markets, and the rights and liabilities of purchasers under such statutes. Particular emphasis will be given to statutes administered by the Securities and Exchange Commission.

- 469 *Research in Patent, Trade-Mark, and Copyright* Harris
Law (2)

Fall—as arranged; spring—as arranged. Registration limited to students with at least a B average who have taken Patent Law I and II and related courses including, as a rule, Trade Regulation Seminar. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

- 471 *Research in Public Law* (2) The Staff
Fall—as arranged; spring—as arranged. Registration limited to students with at least a B average who have had a seminar or comparable course in field of proposed research. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

- 475 *Taxation—Corporate* (2) Hambrick
Fall—evening. Analytical study of income tax problems in corporate dividends and distributions in redemption of stock; corporate liquidations; reorganizations, mergers, and acquisitions; recapitalizations; organization and sales of corporate businesses; collapsible corporations; carryovers. Prerequisite: Law 279.

- 480 *Taxation—Oil and Gas* (2) Hambrick
Spring—evening. A study of the case law relating to percentage depletion, sales and transfers of interests in oil and gas properties; legal aspects of financing methods in oil and gas operations; application of partnership and corporation provisions of the 1954 Internal Revenue Code to oil and gas activities. Prerequisite: Law 279.

- 485 *Taxation Seminar* (2) Hambrick
Spring—evening. Selected problems in federal income, estate and gift taxation, involving factual analysis and legal research, and the preparation of memoranda of law, legislative drafting or other appropriate disposition. Identical problems or cases will be assigned to small groups for development and disposition. Registration subject to approval of teacher. Prerequisite: Law 274 and 279.

- 492 *Trade Regulation Seminar* (2) Weston
Spring—evening. Group study of current problems relating to unfair trade practices and federal antitrust laws.

- 495 *Urban Redevelopment* (2) Orentlicher
Fall—evening. Selected problems in urban redevelopment and housing, with particular emphasis on programs under current federal and state legislation.

MATHEMATICS*

Professors J. H. Taylor (*Emeritus*), F. E. Johnston, F. M. Mears, N. D. Nelson (*Executive Officer*); *Professorial Lecturer* W. H. Marlow; *Associate Professor* T. P. G. Liverman; *Associate Professorial Lecturer* D. M. Dribin; *Assistant Professors* W. A. Smith, R. Z. Vause; *Lecturers* E. L. Williams, Joseph Blum, F. G. O'Brien

Bachelor of Arts or Bachelor of Science with a major in Mathematics (Columbian College—Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, see pages 69 and 70.

Required: in addition to the general requirements of Columbian College as stated on pages 81–87, fifteen semester hours of Mathematics of approved second- and third-group courses.

Master of Arts or Master of Science in the field of Mathematics (Columbian College).—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively, with a major in Mathematics at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88–91.

Doctor of Philosophy (Graduate Council).—See page 97.

Bachelor of Science in Engineering with an option in Mathematics (School of Engineering).—For requirements see pages 132–34 and 136–37.

Bachelor of Arts in Education with a teaching field in Mathematics (School of Education).—Prerequisite: the Education curriculum in the Junior College, page 72.

Required: the Mathematics option, page 164, and the professional courses listed on pages 166–67.

FIRST GROUP†

2 *General Mathematics* (3)

Spring—evening. For students in the School of Education. A study of the basic concepts of elementary mathematics: mathematical proof, the number systems, number notations, function, direct and indirect measurement, and computation. Prerequisite: two years of high school mathematics or Statistics 53, or the equivalent.

The Staff

3 *College Algebra* (3)

Fall—morning and evening; spring—morning and evening; summer 1960. Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

The Staff

6 *Plane Trigonometry* (3)

Fall—morning and evening; spring—morning and evening; summer 1960. Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor).

The Staff

12 *Analytic Geometry* (3)

Fall—morning and evening; spring—morning and evening; summer 1960. Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry.

The Staff

* The Staff of Instruction here listed is for the academic year 1959–60.

† No first-group course in mathematics is available for college credit if the student's previous training in mathematics meets the prerequisite for a higher numbered course.

- 29 *Calculus I* (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1960.
Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12.
- 30 *Calculus II* (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1960.
Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29.
- 31 *Calculus III** (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1960.
Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor), or Mathematics 20.

SECOND GROUP*

- 101 *Introduction to Mathematical Logic* (3) Nelson
Fall—evening. Development of propositional and predicate calculi, basic semantic concepts, elementary intuitive set theory. Prerequisite: Mathematics 31 (or 20) or Philosophy 121.
- 102 *Fundamental Concepts of Mathematics* (3) Nelson
Spring—evening. Boolean algebra, set theory, axiomatic method, foundations of number systems, and geometry. Prerequisite: Mathematics 101 or permission of the instructor.
- 111 *Mathematics for Engineers and Physicists I* (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1960.
Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 30 and 31.
- 112 *Mathematics for Engineers and Physicists II* (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1960.
Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132.
- 122 *Introduction to Abstract Algebra* (3) Vause
Fall—morning.
- 123 *Theory of Equations* (3)
Not offered 1960-61.
- 124 *Introduction to Matrix Algebra* (3) Wiegmann†
Spring—evening.
- 125 *Advanced Algebra* (3) Johnston
Spring—evening.
- 126 *Advanced Analytic Geometry* (3) Taylor
Not offered 1960-61.

* Mathematics 31 (or 20) is prerequisite to all second-group courses.
† Appointment effective September 1960.

- 132 *Differential Equations* (3) The Staff
Fall—evening; summer 1960.
- 134 *Introduction to Boundary Value Problems* (3) The Staff
Spring—evening. Prerequisite: Mathematics 111 or 132.
- 135 *Projective Geometry* (3) Nelson
Fall—morning.
- 139 *Advanced Calculus I* (3) The Staff
Fall—evening; spring—morning; summer 1960. Limits, continuity, real number system, mean value theorems, partial differentiation, implicit function theorems, transformations, and mappings.
- 140 *Advanced Calculus II* (3) Mears
Spring—evening. Vector fields, multiple integrals, line and surface integrals, point set theory, theory of integration, improper integrals. Prerequisite: Mathematics 139.
- 141 *Introduction to Infinite Series* (3) Mears
Fall—evening.
- 167 *Fourier Series and Spherical Harmonics* (3)
Not offered 1960-61 Prerequisite: Mathematics 103, 111, or 132.
- 171 *Vector Analysis* (3) The Staff
Fall—evening; spring—morning.
- THIRD GROUP
- 201-2 *Mathematical Logic* (3-3) Nelson
1961-62 and alternate years.
- 220 *Theory of Numbers* (3) Vause
1961-62 and alternate years.
- 237-38 *Theory of Functions of a Complex Variable* (3-3) Johnston
A year course: credit is not given for the first half until the second half is completed. 1961-62 and alternate years.
- 242 *Infinite Series* (3) Mears
Spring—evening.
- 243-44 *Numerical Analysis* (3-3) Marlow
1961-62 and alternate years. Prerequisite: Mathematics 103, 111, or 132.
- 249 *Ordinary Differential Equations* (3)
Not offered 1960-61.
- 250 *Integral Equations* (3)
Not offered 1960-61.
- 251-52 *Theory of Functions of a Real Variable* (3-3) Liverman
A year course: credit is not given for the first half until the second half is completed. Academic year—evening.
- 255 *Differential Geometry* (3) Taylor
Fall—evening.

- 257 *Theory of Groups* (3) Johnston
Fall—evening.
- 261-62 *Principles of Applied Mathematics* (3-3) Liverman
A year course: credit is not given for the first half until the second half is completed. 1961-62 and alternate years. Generalized functions (Schwartz distributions); applications to differential equations; Green's function, Eigenvalue problems; functional analysis foundations of approximation procedures for applied mathematics. Prerequisite: Mathematics 140 or consent of the instructor.
- 265-66 *Modern Algebra* (3-3) Wiegmann*
Academic year—evening.
- 268 *Calculus of Variations* (3)
Not offered 1960-61.
- 270 *Tensor Analysis* (3) Taylor
1961-62 and alternate years.
- 272 *Hilbert Space* (3)
Not offered 1960-61. Prerequisite: Mathematics 265 or consent of the instructor.
- 277 *Partial Differential Equations* (3) Liverman
Spring—evening.
- 278 *Introduction to Topology* (3) Blum
Fall—evening.
- 295-96 *Reading and Research* (3-3) The Staff
Academic year—as arranged.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1960.

MECHANICAL ENGINEERING†

Professor B. C. Cruickshanks (*Emeritus*); Professorial Lecturer Sanford Thompson; Associate Professors P. A. Crafton, G. C. Weaver‡, A. C. Murdaugh; Assistant Professors P. S. Morgan, Jr., M. H. Moore, Jr., R. L. Dedrick, Lecturer M. A. Garstens

Bachelor of Mechanical Engineering (School of Engineering).—See pages 132-34 and 136 for statement of requirements.

Master of Science in Engineering (School of Engineering).—See pages 139-40 for statement of requirements.

Doctor of Science (School of Engineering).—See pages 142-44.

* Appointment effective September 1960.

† The Staff of Instruction here listed is for the academic year 1959-60.

‡ Deceased.

FIRST GROUP

9 *Introduction to Engineering** (3)

Fall—morning and evening; spring—evening. Number systems, computation aids, scientific method, problem solving techniques, use of mathematical tables. Emphasis is placed on the development of sound reasoning and study methods.

The Staff

10 *Graphical Communication* (2)

Fall—evening; spring—morning and evening. Spatial visualization, engineering drawing, schematic diagrams, descriptive geometry. A laboratory course. Laboratory fee, \$10.

The Staff

SECOND GROUP

100 *Analytical Kinematics* (3)

1960-61 and alternate years: spring—evening; 1961-62 and alternate years: spring—morning. Theoretical study of the motion of constrained and unconstrained rigid bodies. Prerequisite or concurrent registration: Civil Engineering 121, Mathematics 112.

Moore

113 *Thermodynamics I* (3)

Fall—morning and evening. Theoretical study of fundamental concepts, equations of state, first and second laws of thermodynamics, entropy, single and two-phase mixtures. Prerequisite: Chemistry 12, Mathematics 31, Physics 16.

Dedrick

114 *Thermodynamics II* (3)

Spring—late afternoon. Theoretical study of vapor cycles, combustion, gas dynamics, equilibrium, multiphase mixtures. Prerequisite: Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132, Mechanical Engineering 118.

Dedrick

118 *Heat Transfer* (3)

Spring—morning and evening. Heat transfer theory, conduction, convection, radiation, field and potential theory applied to conduction. Prerequisite: Mathematics 112, Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132.

120 *Physical Metallurgy* (3)

1960-61 and alternate years: spring—morning; 1961-62 and alternate years: spring—evening. Physics of metals, crystal and lattice structures, binary and ternary alloys, properties of alloys, nonequilibrium conditions, phase diagrams. Lecture and laboratory. Prerequisite: Civil Engineering 125, Mathematics 31. Laboratory fee, \$10.

Murdaugh

123 *Advanced Dynamics I* (3)

1960-61 and alternate years: fall—evening; 1961-62 and alternate years: fall—morning. Shock and vibrations in linear mechanical systems, electromechanical analogies, transient and steady-state analysis. Prerequisite: Mechanical Engineering 100. Prerequisite or concurrent registration: Civil Engineering 157.

Moore

124 *Advanced Dynamics II* (3)

1960-61 and alternate years: spring—evening; 1961-62 and alternate years: spring—morning. Advanced study of dynamics of continuous mechanical systems. Lagrange's equations, Hamilton's principle, gyroynamics. Prerequisite: Mechanical Engineering 123.

Crafton

* This course should be completed before the beginning of the sophomore year.

- 135-36 Thermal Power (3-3)** Moore
 1960-61 and alternate years: academic year—evening; 1961-62 and alternate years: academic year—morning. Analysis and design principles governing systems and components in heat-power, gas and vapor turbines, internal combustion engines, heat pumps, nuclear power systems. Lecture and laboratory. Prerequisite: Civil Engineering 132; Mechanical Engineering 114, 118; Physics 191. Prerequisite or concurrent registration: Mechanical Engineering 139. Laboratory fee, \$15 a semester.

- 139 Fluid Machinery (3)** Mason
 1960-61 and alternate years: fall—evening; 1961-62 and alternate years: fall—morning. Positive-displacement machines; hydraulic circuits and servo-mechanisms; general theory of dynamic machines; velocity diagrams and work transfer; radial, axial, and mixed-flow machines; torque converters and couplings; jet machines. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 113. Prerequisite or concurrent registration: Mechanical Engineering 123. Laboratory fee, \$10.

- 143 Production Analysis (3)**
 1960-61 and alternate years: fall—morning; 1961-62 and alternate years: fall—evening. Principles of schematic models, mathematical programming, quality control, operations analysis. Prerequisite: Mathematics 112.

- 146 Dynamics of Compressible Fluids (3)** Moore
 1960-61 and alternate years: spring—evening; 1961-62 and alternate years: spring—morning. Mathematical theory of compressible fluid flow, flow around immersed bodies, airfoil theory, shock-wave theory, thermodynamics of compressible fluids. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 118. Laboratory fee, \$10.

- 195-96 Special Topics in Mechanical Engineering (arr.)** The Staff
 Academic year—as arranged. Special problems approved by the Staff. May be substituted for required senior courses. Prerequisite: senior status and approval of the instructor.

THIRD GROUP

- 211 Thermodynamics (3)**
 Fall—evening. Reversible and irreversible processes, equilibrium, ideal and van der Waal's gases, dilute solutions, phase equilibria, electric and magnetic effects, radiation. Introduction to kinetic theory and statistical mechanics.

- 213 Heat Transfer (3)** Craftern
 Spring—evening. Physical and mathematical concepts of heat transfer phenomena under steady and unsteady conditions, including: Stefan-Boltzmann and Planck laws for radiation. Fourier heat equation for conduction, dimensional analysis, and boundary layer theory for convection.

- 215 Gas Dynamics (3)**
 Spring—evening. Theory of gas dynamics including: combustion, shock phenomena, dynamics of flow, and heat transfer for high temperature gases.

- 233 Supersonic Flow and Shock Waves (3)**
 Not offered 1960-61. Advanced theory of supersonic fluid flow. Shock phenomena, spherical waves.

ENGINEERING ADMINISTRATION

Professor J. E. Walters; *Professorial Lecturers* Nathaniel Stewart, F. M. Reynolds, R. J. Wilson, F. P. Hall, K. C. Harder, K. S. Colmen, F. C. Dyer, R. I. Sarbacher, H. J. Barnett, Laurence Heilprin, J. N. Davis, George Tyler; *Associate Professors* John Kaye, B. D. Tillett; *Assistant Professor* J. F. Greenslade; *Lecturer* J. R. Miles, Sr.

Master of Engineering Administration.—See pages 140-42.

Doctor of Science (School of Engineering).—See pages 142-44.

The School of Engineering offers the following courses primarily for candidates for the degree of Master of Engineering Administration. Other courses listed in this program are offered by the departments of Accounting, Business and Public Administration, Psychology, and Statistics.

SECOND GROUP

191 *Engineering Law** (3)

Spring—evening. The influence of contract, property, and tort law upon engineering activities. Legal principles relating to the organization and management of engineering companies and governmental departments; legal procedures of interest to engineers. Topics considered include contracts, agency, partnership, corporations, liens, and expert testimony.

THIRD GROUP

201 *Engineering Administration I* (3)

Walters and Staff

Fall—evening; spring—evening. Application of scientific method to the administrative processes of (1) planning and (2) organizing; including development of objectives, key factors in planning, basics of organization, stages of organizational growth, special problems of organization in an engineering or scientific enterprise.

202 *Engineering Administration II* (3)

Greenslade and Staff

Fall—evening; spring—evening. Continuation of Engineering Administration 201. Application of scientific method to the administrative processes of (3) managing or directing and (4) evaluation and control. Study of delegation; decentralization; personnel relations; management development; systems engineering; automation; financial analysis, budgeting, and administrative audits.

206 *Human Relations in Administration* (3)

Walters

Fall—evening; spring—evening. The meaning, principles, and practices of management development and personnel relations; collective bargaining; principles and practices of personnel administration; professional social relations.

251 *Management of Research and Development* (3)

The Staff

Fall—evening; spring—evening. Management problems involved in the administration of research and development programs; exploration of techniques in programming; selection of organizations for research, maintenance, control, and evaluation of projects.

252 *Production and Maintenance Management* (3)

The Staff

Fall—evening; spring—evening. Planning, organizing, and managing of production and systems. Managerial implications of automation. Study of skills

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies.

- and abilities essential to industrial management, including maintenance of equipment and real property.
- 261 *Economic Analysis in Engineering Planning* (3) Hall
Fall—evening; spring—evening. Application of economic principles to engineering administration: inputs, outputs, investments, and prices. Studies are made of the methods of analyzing economic factors in evaluating alternate courses of administrative action in government and industry.
- 263 *Quantitative Techniques of Engineering Administration* (3)
Spring—evening. Application of the various quantitative techniques, mathematical, statistical, and other management sciences' techniques to the analysis of engineering administration and the solution of administrative problems by the use of models, theories, and measurements.
- 271 *Operations Research* (3) Kaye and Staff
Fall—evening; spring—evening. Background and application of operations research; history, characteristics, capabilities, administrative considerations, cases, methods, and techniques, including construction of conceptual and mathematical models.
- 272 *Problems in Operations Research* (3) Kaye
Spring—evening. Illustrations of the application of operations research by study of case histories: examples of the formulation and preliminary order-of-magnitude case; examples of broader scope.
- 273-74 *Techniques of Operations Research* (3-3) Heilprin
Academic year—evening. Theory and application of techniques used in operations research, including order-of-magnitude estimation, probability and mathematical statistics, symbolic logic, inequality-constrained stationary-value problems, dynamics of populations, Monte Carlo simulation, strategic gaming, and error and sensitivity analysis.
- 295 *Applied Research in Engineering Administration* The Staff
(arr.)
Fall—as arranged; spring—as arranged. Application of established principles to new engineering administrative situations; the development of new knowledge of administration.
- 296 *Research in Engineering Administration* (arr.) The Staff
Fall—as arranged; spring—as arranged. Creative thinking in engineering administration, initiation of new theories and principles, development of new hypotheses, experimentation, proof of theories and hypotheses.
- 299-300 *Thesis* (3-3)
Academic year—as arranged.

MEDICINE*

Professors T. M. Brown (*Executive Officer*), M. J. Romansky, L. K. Alpert; *Clinical Professors* C. R. L. Halley, C. B. Ethridge; *Associate Professors* J. M. Evans, A. E. Parrish, C. R. Hartman; *Associate Clinical Professors* Pearl Holly, J. J. Feffer, A. G. Prandoni, Halla Brown;

* The Staff of Instruction here listed is for the academic year 1959-60.

Assistant Professors S. W. Bush, W. R. Felts, Jr., G. A. Kelser, Jr.;
Assistant Clinical Professors J. A. Reed, T. J. Abernethy, Roy Hertz,
 Benjamin Manchester, L. G. Lederer, J. E. Smith, J. W. Trenis, L. E.
 Putnam, E. H. Hill, J. E. Rall, B. H. Sullivan, Jr., J. A. Owens, Jr.,
 L. J. Thomas, M. H. Stolar, Alfred Brigulio, T. S. Sappington, S. J. N.
 Sugar, Joseph Ney, Joseph Beinstein, F. S. Bacon, H. D. Ecker, J. J.
 Rheingold, I. G. Tamagna, J. W. Latimer, Jr., C. W. Jones, C. W.
 Thompson, E. S. Gladsden, Maurice Mensh, Arthur Rosenbaum, F. J.
 Murray, E. P. Parker III, M. H. Rosenberg, J. W. DuChes, W. O.
 Bailey, Jr., Milton Gusack, Jack Kleh, T. A. Gonder; *Associates* Maurice
 Protas, C. W. Ordman, R. B. Castell, S. T. Gibson, R. B. Miller, Ernest
 Cotlove, T. J. Kennedy, Jr., Jack Orloff, J. B. Marbury, Louis Ross,
 F. D. Chapman, L. H. Snyder, R. G. Taylor, J. W. Long, Irvin Kerlan,
 V. P. Beelar, L. S. Blumenthal, S. W. Kirstein, J. F. Ambury, R. N.
 Coale, Israel Kessler, W. D. Brill, Marvin Fuchs, W. J. Weaver, Jr.,
 R. B. Benedict, H. M. Silver, J. T. Burns, T. L. Hartman, Boris Rabkin,
 M. H. Rose, C. A. Schulman, L. A. Craig, Jr., A. W. Danish, Adolph
 Friedman, A. R. Sweeney, Jr., Albert Sjoerdsma*, Alvin Seltzer, S. D.
 Loube, Alfred Baer, Herbert Abramson, H. K. Beye, J. H. Pert, John
 Walsh, C. E. Law, E. L. Rea, J. P. Mann, Conrad Gossels, J. E. Chap-
 man, M. H. Jacobson, G. K. Duschak, H. O. Mott, I. I. H. Siu, Bertle
 Nelson, W. K. Billingsley, Jr., H. E. Ticktin, W. J. Shewe; *Instructor*
 R. C. Fowler; *Clinical Instructors* E. H. Bauersfeld, H. C. Bates, J. C.
 Bateman, George Sharpe, William Lewis, M. A. Sislen, W. H. Crosby,
 J. H. Watson, C. J. Savarese, Jr., B. R. Cooperman, N. H. Rubenstein,
 M. G. Sherer, D. M. Watkin, Edward Adelson, G. J. Fisher, W. L.
 Stone, Jacob Robbins, B. H. Ostrow, J. C. Mandes, C. D. Cooper, R. R.
 Belton, R. L. Howard, Walter Kurland, E. J. Leonard, P. W. Yost,
 R. S. Gordon, Jr., D. S. Frederickson, S. C. Pascoe, W. R. Ehrmantraut,
 Jack Crowell, D. S. Davis, H. E. Richardson, J. W. Roark, J. H. Epstein,
 G. C. Buchanan, Montague Lane, F. K. Harris II, Audry Connor, H. I.
 Passes, C. W. Foulke, M. K. McCabe, H. H. Orvis, A. A. Lear, O. W.
 Donnelly, R. F. Dyer, E. H. Levine, R. S. Poole, P. R. Vagelos, A. D.
 Merritt, H. C. Sadin, S. J. Talpers, G. I. Shugoll

Special Lecturers A. D. Kistin, W. K. Myers, Sol Katz, R. W. Berliner,
 Henry Field, Jr., T. H. McGavack, P. D. Comanduras, W. L. Nalls

106 *Living Anatomy*

Spring—1 hour a week. An introduction to physical diagnosis, with special
 emphasis on topographical anatomy.

236 *Clinical Microscopy*

Spring—3 hours a week. Conferences and studies in the clinical application
 of laboratory examinations of blood, body fluids, exudates, excreta.

* On leave of absence 1959-60.

- 242 *Physical Diagnosis* The Staff
Spring—6 hours a week. Covers not only theoretical but practical application of principles of physical diagnosis as related to examination of patients.
- 243-44 *Introduction to Medicine* The Staff
Academic year—2 hours a week. Lectures covering the principles of internal medicine preparatory to clinical studies and training in the inpatient and outpatient services.
- 325-26 *Clinical Clerkship* The Staff
Eight weeks as arranged during academic year. Training with bed patients under individual instruction designed to develop ability in examination of patients and case taking as well as practice in clinical microscopy. D. C. General Hospital.
- 327 *Clinical Pathological Conferences I* The Staff
Fall—1 hour a week. Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are compared.
- 339-40 *Therapeutic Conferences I* Staff of Medicine and Pharmacology
Academic year—1 hour a week. Conferences designed to emphasize the application of pharmacological principles to the problems of clinical medicine. University Hospital.
- 349-50 *Medical Conferences* The Staff
Academic year—2 hours a week. D. C. General Hospital.
- 421-22 *Outpatient Clinics* The Staff
Six weeks as arranged during academic year. Individual case studies under personal supervision of the Staff. Daily clinics on current medical problems and seminars stressing physiological aspects of diseases. Individual examinations and instruction in medical specialties. University Hospital.
- 423-24 *Clinical Clerkship* The Staff
Six weeks as arranged during academic year. University, Mt. Alto, and D. C. General hospitals.
- 427-28 *Clinical Pathological Conferences II* The Staff
Academic year—1 hour a week. Continuation of Medicine 327.
- 429-30 *Clinical Pathological Conferences III* The Staff
Academic year—1 hour a week. Conferences are held at the University Hospital. Attendance is required of students during their medical clerkships there.

NEUROLOGY AND NEUROLOGICAL SURGERY*

Professors J. W. Watts (*Executive Officer*), Harold Stevens; *Professorial Lecturer* S. S. Kety; *Associate Clinical Professors* H. D. Shapiro, R. H. Groh, J. M. Williams; *Assistant Clinical Professors* J. P. Murphy,

* The Staff of Instruction here listed is for the academic year 1959-60.

H. V. Rizzoli, A. S. Dekaban, Paul Chodoff; *Associates* G. D. Weickhardt, Harvey Ammerman, G. J. Hayes, C. A. Marsan; *Clinical Instructors* M. C. Korengold, J. T. Lord, D. F. Mott, N. H. Horwitz, Z. W. Sanders, Ntinos Myrianthopoulos, R. H. Robertson, R. A. Mendelsohn, R. E. K. Jakoby

- 249 *Neurology: Basic* Stevens, Williams
Fall—1 hour a week. Methods used to study the form and function of the nervous system. Lectures and laboratory demonstrations.
- 250 *Neurology* Stevens, Shapiro
Spring—1 hour a week. Introductory lectures on clinical neurology with specimens, lantern slides, and motion pictures.
- 331 *Neurology and Neurological Surgery* Watts, Stevens
Fall—1 hour a week. Clinical lectures and demonstrations.
- 333-34 *Neurology and Neurological Surgery, Clinical Clerkship* Stevens, Williams, Ammerman
In conjunction with Neurology 335-36. Two weeks in rotation as arranged during academic year. Instruction in history, physical examination, ordinary clinical procedures. Attendance at neurosurgical operations. Six students in rotation. D. C. General Hospital.
- 335-36 *Neurosurgical Conferences* Watts and Staff
Clinical conferences weekly. Six students in rotation. D. C. General Hospital.
- 431-32 *Neurology and Neurological Surgery Clinic* Shapiro, Rizzoli
Two hours a week for three weeks in rotation as arranged during academic year. Neurological outpatient clinic. Consultation of staff on ambulatory cases, demonstration of diagnostic procedures. Six students in rotation. University Hospital.
- 433-34 *Clinical Neurology* Groh, Sanders
Two hours a week for three weeks in rotation as arranged during academic year. Neurological inpatient examinations and demonstrations. Six students in rotation. St. Elizabeths Hospital.
- 435-36 *Neurological Surgery (elective)* The Staff
Academic year—bimonthly. Lectures and motion picture demonstration of neurosurgical problems.

OBSTETRICS AND GYNECOLOGY*

Professors John Parks, R. H. Barter (*Executive Officer*); *Clinical Professors* H. L. Darner, George Nordlinger; *Associate Clinical Professor* S. M. Dodek; *Assistant Professors* J. G. Sites, W. P. McKelway; *Assistant Clinical Professors* J. K. Cromer, J. A. Dusbabek, C. K. Fraser,

* The Staff of Instruction here listed is for the academic year 1959-60.

Caroline Jackson; *Associates* B. W. Richwine, F. S. Rogers, R. M. Roll, W. T. Lady, J. W. Pearson, Jr., T. M. Leonard, S. S. Martin, N. J. Price, T. A. Wilson; *Clinical Instructors* J. R. Epstein, M. S. Kaufman, S. H. Shea, A. S. Bright, R. E. Bieren, M. P. Footer, Donald Walters, J. M. Friedman, L. M. Liverett, W. H. Cooper, Peter Soyster, H. P. Treichler, J. C. Walsh, I. W. Rovner, M. W. Sandmeyer, N. M. Tart, W. D. Wallace, Jr.

254 *Introduction to Obstetrics and Gynecology* Dodek, Fraser
Spring—1 hour a week. Lectures and demonstrations on the development and physiology of the female reproductive system and the management of normal pregnancy.

301-2 *Manikin Demonstrations* Footer, Friedman
One hour a week for eight weeks in rotation as arranged during academic year. The mechanism of labor and various types of operative delivery demonstrated to sections of the junior class. D. C. General Hospital.

337-38 *Obstetrics and Gynecology* Parks, Barter, Sites, McKelway
Academic year—2 hours a week. Lectures and demonstrations on the principles of obstetrics and gynecology.

351-52 *Clinical Clerkship* The Staff
Four weeks during academic year as arranged. Clerkship with patients, including ward rounds, operating room demonstrations, and weekly clinic. D. C. General Hospital.

439-40 *Clinic in Obstetrics and Gynecology* Barter, Sites, McKelway

Two hours a week for eight weeks in rotation as arranged during academic year. Student presentation and discussion of patient problems. Demonstration of equipment used in obstetric and gynecologic practice.

441-42 *Clinical Obstetrics* The Staff
Academic year—as arranged. Students participate in prenatal and post-natal clinic care, observe the course of labor and deliver patients under supervision, observe and participate in the gynecological clinics and operating rooms of the University and D. C. General hospitals, attend bi-weekly departmental conferences and daily ward rounds in the University and D. C. General hospitals.

443-44 *Clinical Gynecology* The Staff
Eight weeks in rotation as arranged during academic year. Students observe and participate in the gynecological clinics and operating rooms of the University and D. C. General hospitals.

OPHTHALMOLOGY*

Professor R. A. Cox (*Executive Officer*); Clinical Professor E. A. W. Sheppard; Assistant Clinical Professor R. W. Wilkinson; Associates W. J. Romejko, W. P. Chalfant, Jr., W. J. G. Davis, R. E. duPrey,

* The Staff of Instruction here listed is for the academic year 1959-60.

Robert Day, M. G. Alper; *Clinical Instructors* J. H. Gilligan, J. H. Lodge, W. B. Glew, J. R. Weimer

352 Ophthalmology

Spring—one hour a week for sixteen weeks as arranged. Lecture course presenting aspects of all the principles of ophthalmology.

The Staff

447-48 Clinic

Academic year—as arranged. Each student is given individual instruction in ophthalmological diagnosis.

The Staff

OTOLARYNGOLOGY*

Associate Clinical Professor J. J. McFarland, Jr. (*Executive Officer*); *Assistant Clinical Professors* Catharine Birch, J. L. Levine; *Associates* M. E. Krucoff, W. B. Walters, R. S. Page, Jr., J. A. Sabri, W. M. Tribble

351 Otolaryngology

Spring—I hour a week for fourteen weeks. Lectures and demonstrations on anatomy, physiology, and diseases of the ear, nose, and throat.

The Staff

354 Bronchoscopy

Spring—I hour a week for two weeks. A series of lectures on the fundamental principles and the use of instruments, including both the bronchoscope and esophagoscope.

The Staff

355-56 Clinic

One and one-half hours a week in rotation as arranged during academic year. Practical clinical instruction in the diagnosis and treatment of diseases of the ear, nose, and throat. D. C. General Hospital.

The Staff

PATHOLOGY*

Professor T. M. Peery (*Executive Officer*); *Clinical Professor* D. L. Weiss; *Associate Professors* F. N. Miller, Jr., William Newman; *Assistant Professor* W. L. Marsh; *Associate* L. I. Platt

SPECIAL STAFF FOR DEMONSTRATIONS

Associate Clinical Professor J. S. Howe; *Assistant Clinical Professors* E. F. Geever, R. G. Gottschalk, R. E. Palmer; *Associates* L. E. Zimmerman, W. F. Enos, L. W. Fix; *Clinical Instructors* C. B. Cook, C. P. Barnett, D. R. Parkinson

Special Lecturers E. B. Helwig, L. C. Johnson

* The Staff of Instruction here listed is for the academic year 1959-60.

Bachelor of Science in Medical Technology (Columbian College—Departmental).—Prerequisite: the Medical Technology curriculum in the Junior College, see page 70, including Chemistry 11-12, Zoology 1-2, and Bacteriology 112.

Required: the general requirements of Columbian College as stated on pages 81-87, including Chemistry 21 and 22, and the following second-group courses offered in the University Hospital: Pathology 115-16, 117-18, and 119.

Admission to the Medical Technology Course does not assure admission to the Hospital program. (See "Medical Technology Course", pages 112-13.)

115-16 *Introduction to Medical Science (1-1)* Marsh and Staff
Academic year—1 hour a week. For Students in medical technology at the University Hospital. These lectures, based upon physiology, pathology, and medicine, provide a background for the interpretation of laboratory data.

117-18 *Principles in Medical Technology (4-4)* Marsh and Staff
Academic year—4 hours a week. For students in medical technology at the University Hospital. Theories, principles, and sources of error, of the methods used in clinical chemistry, clinical bacteriology, serology, hematology, and clinical microscopy.

119 *Medical Technology Laboratory (20)* Marsh and Staff
30 hours a week for 50 weeks. Practice and experience by rotation through the various divisions of the Pathology laboratories of the University Hospital, as follows: hematology and urinalysis, 12 weeks; chemistry, 12 weeks; bacteriology and parasitology, 10 weeks; blood bank, 8 weeks; serology, 4 weeks; tissue pathology, 4 weeks.

259-60 *Pathology* Peery, Miller
Fall—9 hours a week; spring—3 hours a week. General pathology of inflammations, degenerations, malformations, and neoplasms. Special pathology of the organs and specific diseases. The laboratory work consists of the gross and microscopic study of diseased tissue. Special emphasis is placed on the interrelationships of the various pathologic changes and their correlation with symptoms and physical signs.

261-62 *Necropsy* The Staff
Academic year—as arranged. Students are required to attend and assist in the performance of necropsies at the University Hospital.

263-64 *Demonstrations in Pathology* Special Staff
Academic year—1 hour a week. Gross specimens from several hospitals are demonstrated and discussed.

267-68 *Seminars in Pathology* Special Lecturers
Academic year—as arranged. Advanced lectures are presented as arranged on special topics in pathology.

270 *Forensic Pathology and Medical Jurisprudence* Miller
Spring—1 hour a week. Forensic pathology, toxicology, chemistry, and immunology. The legal and ethical rights and responsibilities of physicians. Legal problems in medicine.

323-24 *Surgical Pathology I* Weiss
Academic year—1 hour a week. Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing current surgical specimens.

327 *Clinical Pathological Conferences I*

Fall—1 hour a week. Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are correlated. The Staff

427-28 *Clinical Pathological Conferences II*

Academic year—1 hour a week. Continuation of Pathology 327. The Staff

429-30 *Clinical Pathological Conferences III*

Academic year—1 hour a week. Conferences are held at the University Hospital. Attendance is required of students during the medical clerkship there. The Staff

492 *Surgical Pathology II*

Spring—1 hour a week. A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically. Newman

493-94 *Pathology Clerkship (elective)*

Academic year—as arranged. A limited number of students receive training in surgical pathology and necropsies in the laboratories of the University Hospital. The Staff

PEDIATRICS*

Clinical Professors M. M. Nicholson, Edward Lewis, W. S. Anderson, R. H. Parrott, L. E. Hoeck; *Associate Clinical Professors* J. A. Washington, R. S. Lourie, T. E. Reichelderfer, W. A. Howard (*Executive Officer*); *Assistant Clinical Professors* M. F. Gutelius, M. H. Grosvenor, Aaron Nimetz, George Maksim; *Associates* J. H. Peacock, Jr., M. I. Cohen, M. K. L. Sartwell, A. B. Coleman, C. F. Stiegler, H. G. Clark, Adrian Recinos, Jr., R. E. Martin, C. R. Webb, William Stark, A. R. McPherson; *Instructor* F. W. S. Min; *Clinical Instructors* H. H. Diamond, R. H. Mitchell, R. O. Warthen, E. A. Black, R. H. Anderson, W. G. Preisser, S. L. Leikin, Bennett Olshaker, H. T. Yates, Roger Bergstrom, G. J. Cohen, M. S. Glatt, M. I. Mones, M. A. V. Fox, J. L. Hatleberg, S. Z. Goldblatt, H. C. Millar, Harold Plotsky, A. J. Modlin, J. R. Puig

Special Lecturer M. E. Wegman256 *Pediatrics*

Spring—2 hours a week. Lectures on physiology of the newborn, normal behavior, emotional and physical development, infant nutrition, diseases of the newborn, common anomalies and system illnesses of infancy and childhood. The Staff
Medical School.

* The Staff of Instruction here listed is for the academic year 1959-60.

- 357-58 *Clinical Clerkship: General Pediatrics* Reichelderfer and Staff
Two weeks as arranged during academic year. Introduction to clinical pediatrics. Emphasis on bedside discussion and group seminars including the newborn. Ward rounds. Five students in rotation. D. C. General Hospital.
- 359-60 *Clinical Clerkship: Contagious Diseases* Reichelderfer and Staff
Two weeks as arranged during academic year. Conferences and bedside discussion on contagious and infectious diseases. Prevention and quarantine measures. Five students in rotation. D. C. General Hospital.
- 361-62 *Clinical Conferences I* Min and Staff
Academic year—1 hour a week. Required. Presentation and discussion by students of current patient problems. D. C. General Hospital.
- 363-64 *Ward Rounds* Nicholson, Min, and Staff
Academic year—as arranged. Bi-weekly ward rounds, with students and Resident Staff. D. C. General Hospital.
- 365-66 *Psychiatry* Lourie and Staff
Academic year—as arranged. Lectures on normal behavior and emotional development. Clinical case analysis.
- 457-58 *Clinical Clerkship* Howard and Staff
Six weeks as arranged during academic year. Full time, including assignment to night and holiday admissions. Case studies on wards under direct Resident supervision. Ward rounds with Staff and Residents. Twelve students. Children's Hospital.
- 459-60 *Outpatient Clinics* Howard
Academic year—as arranged. Work in Medical and Specialty clinics including surgery, allergy, X-ray, child welfare, cardiology, dermatology, neurology, and child guidance. Children's Hospital.
- 461-62 *Clinical Pathological Conferences* Howard and Staff
Academic year—1 hour a week. Clinical and pathological discussion of recent patient history and laboratory data. Children's Hospital.
- 463-64 *Section Conferences* The Staff
Academic year—twice a week. Discussion of clinical problems of diagnosis and treatment of current patients. Children's Hospital.
- 465-66 *Section Conferences* The Staff
Academic year—1 hour a week. Surgical diagnosis, pre- and post-operative management. Children's Hospital.
- 467-68 *Clinical Conferences II* Goldblatt and Staff
Academic year—1 hour a week. Required. Case presentation by students. Staff and student discussion of diagnosis and management. Medical School.
- 469-70 *Child Guidance and Development* Lourie
Academic year—as arranged. Clerkship in fourth year including Well Baby Clinic. Group and class conferences.

PHARMACOLOGY*

Professors P. K. Smith (*Executive Officer*), H. G. Mandel; *Clinical Professor* R. G. Smith; *Professorial Lecturer* B. B. Brodie; *Associate Professors* Clarke Davison, R. M. Wiedersheim (*Research*); *Assistant Professors* P. B. Danneberg, L. V. Caso (*Research*), A. C. Hollinshead (*Research*)

Special Lecturer W. V. C. Leahy

Master of Arts or Master of Science in the field of Pharmacology (Columbian College).—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively. The undergraduate program must include the following courses or the equivalent: Biology 1-2 or Zoology 1-2; Physics 12, 13, 16; Chemistry 11-12, 22, 151-52. Biochemistry 221-22 and Physiology 115, 117 are recommended as the undergraduate electives if the candidate wishes to complete the work for the Master's degree in one year.

Required: the general requirements of Columbian College as stated on pages 188-91. The thirty hours of required work must include Biochemistry 221-22; Physiology 115, 117; Pharmacology 261, 263, 267-68, 269-70, 299-300. The remaining courses may be selected from Biochemistry 224, 225-26, 232; Physiology 150; Bacteriology 112, 209, 230; Pharmacology 280.

Master of Arts or Master of Science in the field of Chemotherapy (Columbian College).—Prerequisite: a Bachelor of Arts or a Bachelor of Science degree, respectively. The undergraduate program must include the following courses or the equivalent: Biology 1-2 or Zoology 1-2, 41-42; Physics 12, 13; Chemistry 11-12, 22, 151-52. Biochemistry 221-22 is recommended as an undergraduate elective if the candidate wishes to complete the work for the Master's degree in one year.

Required: the general requirements of Columbian College as stated on pages 188-91, including Bacteriology 112; Biochemistry 221-22; Pharmacology 261, 263, 267-68, 269-70, 299-300. The remaining courses may be selected from Bacteriology 209, 229, 230; Biochemistry 224, 225, 226, 232; Physiology 115, 117; Pharmacology 261, 263.

Doctor of Philosophy (Graduate Council).—See page 98.

249-50 *Introduction to Medical Research*†(3-3)

Academic year—Sat., 8:00 A.M. to 1:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

261 *Pharmacology* (5)

Fall—5 hours a week. Lectures and conferences concerning the interaction of drugs and biological systems as a basis for the rational therapy of disease. Open to qualified nonmedical students.

262 *Chemotherapy* (1)

Spring—1 hour a week. Continuation of Pharmacology 261.

* The Staff of Instruction here listed is for the academic year 1959-60.

† This is an interdepartmental course. The student should register in the department directing his research.

- 263 *Pharmacology Laboratory* (1) The Staff
Fall—3 hours a week. Laboratory instruction and demonstrations designed to complement Pharmacology 261. Open to qualified nonmedical students.
- 267-68 *Pharmacological Research* (arr.) The Staff
Academic year—as arranged. Primarily for those properly qualified graduate and medical students seeking careers in pharmacology.
- 269-70 *Pharmacology Seminar* (1-1) The Staff
Academic year—2 hours a week. Recent advances in pharmacology. For those interested in pharmacological research. Open to qualified nonmedical students.
- 279-80 *Special Methods in Research* (arr.) The Staff
Academic year—as arranged. A course to familiarize the student with advanced biochemical, microbiological, and physiological methods employed in pharmacological investigations. Open to qualified nonmedical students.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged. Required of Master of Arts and Master of Science candidates.

PHARMACY*

Professor C. W. Bliven (*Executive Officer*); Associate Professor R. M. Leonard; Associate Professorial Lecturer C. G. Frailey; Assistant Professors F. D. Cooper, C. J. Kokoski, S. M. Schwartz; Instructor G. G. Koustenis

Special Lecturers W. P. Briggs, J. L. Powers, L. E. Kazin, Karl Bambach, D. L. Finucane, W. S. Apple, F. C. McAleer, G. F. Archambault, M. L. Yakowitz

Bachelor of Science in Pharmacy (School of Pharmacy).—Prerequisite: the Pharmacy curriculum in the Junior College, see pages 71-72. The requirements for the degree are stated on pages 147-52.

Master of Science in Pharmacy (School of Pharmacy).—Prerequisite: the degree of Bachelor of Science from an accredited institution. The requirements for the degree are stated on pages 152-54.

FIRST GROUP

- 1 *Introductory Pharmacy* (2) Bliven
Fall: lecture and field trips—morning. Introduction to pharmacy through the study of professional areas in which pharmacists are employed. Field trips include visits to representative retail and hospital pharmacies, wholesale drug houses, and museums.

* The Staff of Instruction here listed is for the academic year 1959-60.

- 2 *History of Pharmacy* (1) Bliven
Spring—morning. Survey of the historical development and progress of the profession from ancient times to the present.
- 23 *Pharmacognosy* (3) Leonard
Fall: lecture (2 hours)—morning; laboratory (3 hours)—morning and afternoon. Macroscopic and microscopic. Prerequisite: Botany 1. Laboratory fee, \$11.

SECOND GROUP

- 101 *Inorganic Pharmaceutical Chemistry* (3) Schwartz
Fall: lecture (2 hours)—morning, laboratory (3 hours)—afternoon. A study of the occurrence, methods of preparation, properties and uses of the important inorganic chemicals encountered in pharmacy and medicine. Prerequisite or concurrent registration: Chemistry 21. Laboratory fee, \$11.
- 102 *Dispensing Pharmacy* (4) Kokoski, Koustenis
Spring: lecture (2 hours), laboratory (6 hours)—afternoon. Compounding of typical prescriptions and a study of incompatibilities. Prerequisite: Pharmacy 122; concurrent registration: Pharmacy 110. Laboratory fee, \$18.
- 103 *Dispensing Pharmacy* (4) Kokoski, Koustenis
Fall: lecture (2 hours)—morning, laboratory (6 hours)—afternoon. Continuation of Pharmacy 102. Laboratory fee, \$18.
- 105-6 *Pharmacology I* (2-2) Leonard
Academic year—afternoon. The general principles of pharmacology; drugs acting locally on skin and mucous membranes; drugs acting locally in the gastrointestinal tract; drugs affecting the blood and blood-forming organs; dietary adjuncts; drugs affecting water balance; anti-infectives; and their major clinical indications or therapeutic uses. Prerequisite or concurrent registration: Physiology 115 (fall); Bacteriology 112 (spring).
- 107 *Pharmacy Accounting* (3) Koustenis
Fall—morning. The financial records required in the operation of a pharmacy.
- 109 *First Aid* (1) Schwartz
Fall—morning. Standard course in first aid methods and practice.
- 110 *Chemistry and Pharmacy of Medicinal Products* (3) Schwartz
Spring—morning. Chemistry, structural relationship to action, and uses of the official and important nonofficial synthetic and natural organic medicinal compounds. Prerequisite or concurrent registration: Chemistry 152.
- 111 *Chemistry and Pharmacy of Medicinal Products* (3) Schwartz
Fall—morning. Continuation of Pharmacy 110. Prerequisite: Pharmacy 110.
- 112 *Physical Pharmacy* (4) Schwartz
Spring: lecture (3 hours)—morning; laboratory (3 hours)—afternoon. Physico-chemical principles and laws as they apply to pharmaceutical systems and preparations. Prerequisite: Pharmacy 101 and 110; concurrent registration: Pharmacy 111. Laboratory fee, \$11.

- 113 *Chemistry and Pharmacy of Medicinal Products* (1) Schwartz
Laboratory (3 hours). Fall—afternoon; spring—afternoon. Preparation of selected official organic drugs. Prerequisite: Pharmacy 110. Prerequisite or concurrent registration: Pharmacy 111. Laboratory fee, \$11.
- 115 *History of Pharmacy* (3) Bliven
Fall—morning. Historical development of the profession, including the literature, from ancient times to the present.
- 121-22 *General Pharmacy* (4-4) Kokoski, Cooper, Schwartz
First half: fall—lecture (3 hours), laboratory (3 hours)—afternoon. Second half: spring—lecture (2 hours), laboratory (6 hours)—afternoon. Essential pharmaceutical processes; theory and manufacture of pharmacopeial and formula galenical preparations; pharmaceutical usage of certain classes of substances and preparations. Laboratory fee: Pharmacy 121, \$11; Pharmacy 122, \$18.
- 125 *Pharmaceutical Calculation* (3) Bliven
Fall—morning. Systems of weights and measures and their application in the practice of pharmacy.
- 126 *Pharmacognosy* (3) Leonard
Spring—morning. Antibiotics, immunologic agents, allergens, hormones, vitamins, and pesticides. Prerequisite or concurrent registration: Bacteriology 112; Physiology 115.
- 127 *Pharmacognosy* (3) Leonard
Fall: lecture (2 hours)—morning; laboratory (3 hours)—morning and afternoon. Practices and procedures for the production, preservation, protection, and evaluation of crude drugs; biosynthetic origin of drugs and pharmaceuticals, representative examples, and their value in pharmacy and medicine. Prerequisite: Botany 1; Chemistry 151-52; Zoology 1 or 2. Laboratory fee, \$11.
- 164 *Introduction to Pharmacology* (3) Leonard
Spring—morning. Historical development, literature, and general principles of pharmacology; general anatomical, physiological, and pharmacological considerations of the autonomic, central, and somatic nervous systems; cardiovascular, gastrointestinal, and genitourinary systems; skin and mucous membranes. Prerequisite: Physiology 115; Zoology 2. Prerequisite or concurrent registration: Biochemistry 221-22.
- 165-66 *Pharmacology* (3-4) Leonard
First half: fall—lecture (3 hours), morning. Second half: spring—lecture (3 hours), morning; laboratory (4 hours), afternoon. Drugs acting on the autonomic, central, and somatic nervous systems; cardiovascular, hematopoietic, genitourinary, endocrine, and digestive systems; histamine and antihistaminics; anti-infective agents; miscellaneous drugs; and their major clinical indications or therapeutic uses. Prerequisite: Bacteriology 112; Biochemistry 121-22; Pharmacy 164. Pharmacy 166: laboratory fee, \$18.
For students in the four-year program, Pharmacy 166 is a 3 credit course (lecture—2 hours; laboratory—4 hours). Such students will receive instruction on drugs acting on the skin and mucous membranes; digestive, hematopoietic, and urinary systems; and anti-infective agents in Pharmacy 105-6. Biochemistry 221-22 is taken concurrently with Pharmacy 165-66 in the 4-year curriculum.

- 167-68 *Pharmacology III* (3-3) Leonard
First half: spring—as arranged. *Second half:* not offered 1960-61. Laboratory work in pharmacological technique. Prerequisite: Pharmacy 106. Prerequisite or concurrent registration: Pharmacy 165. Laboratory fee, \$18 a semester.
- 172 *Advanced Dispensing Pharmacy* (3) Kokoski
 Spring—morning. The study of special problems in dispensing pharmacy. Prerequisite: Pharmacy 103. Laboratory fee, \$18.
- 174 *Quantitative Pharmaceutical Analysis* (3) Bliven, Schwartz
 Spring: lecture (1 hour), laboratory (6 hours)—morning. Drug analysis. Prerequisite: Chemistry 22. Laboratory fee, \$18.
- 176 *Pharmaceutical Law* (3) Frailey
 Spring—morning. Students in the four-year program receive 2 semester hours of credit.
- 178 *Pharmacy Management* (4) Koustenis
 Spring—morning. Policies and operations relating to the management of pharmacy.
- 182 *Advanced Pharmacology I* (2) Leonard
 Not offered 1960-61. Special problems in the field of pharmacology. Prerequisite or concurrent registration: Pharmacy 166.
- 184 *Special Problems in Pharmacy* (arr.) Kokoski, Schwartz
 Fall—as arranged; spring—as arranged. Directed laboratory and library research on special problems in pharmacy and pharmaceutical chemistry. For selected undergraduate students. Prerequisite: Pharmacy 102 and 110. Fees to be arranged.
- 188 *Survey* (1) Bliven and Staff
 Spring—morning. A symposium covering the various phases of pharmacy.
- 190 *Hospital Pharmacy* (1) Cooper
 Spring—afternoon. Organization and functions of hospitals; organization and operation of a hospital pharmacy; professional and sickroom supplies. Prerequisite: Pharmacy 102.
- 192 *Hospital Pharmacy: Prescription Practice* (1) Cooper and Staff
 Fall—as arranged; spring—as arranged; summer 1960. Prescription practice in the University Hospital Pharmacy. Prerequisite: Pharmacy 102.
- 194 *Manufacturing Pharmacy* (3) Cooper and Staff
 Lecture (1 hour), laboratory (6 hours). Fall—as arranged; spring—as arranged; summer 1960. The manufacture of bulk pharmaceuticals in the University Hospital Pharmacy. Elective for seniors.

THIRD GROUP*

- 201-2 *Survey of Pharmaceutical Literature* (1-1) The Staff
 Assigned library research on the development of pharmaceutical literature.

* Courses in this group are not offered in 1960-61.

- 203-4 *Special Problems in General Pharmacy* (2-2) Kokoski
Investigations of problems involved in the manufacture of pharmaceutical preparations on a laboratory scale. Laboratory fee, \$18 a semester.
- 206 *Pharmaceutical Technology* (4) Kokoski, Cooper
Lecture (2 hours); laboratory (6 hours). A study of advanced manufacturing pharmacy, including formula development for the different types of preparations. Laboratory fee, \$18.
- 215-16 *Advanced Pharmacology II* (3-3) Leonard
Lecture (1 hour); laboratory (6 hours). Special studies on biological assay methods. Laboratory fee, \$18 a semester.
- 221-22 *Chemistry of Naturally Occurring Organic Medicinal Products* (5-5) Schwartz
Lecture (3 hours); laboratory (6 hours). A study of the isolation, chemistry, and relationship between the constitution and physiologic action of alkaloids, fats and sterols, terpenes, carbohydrates, glycosides, and the various biological products. Laboratory fee, \$18 a semester.
- 223-24 *Chemistry of Synthetic Organic Medicinal Products* (5-5) Schwartz
Lecture (3 hours); laboratory (6 hours). A study of the chemistry and relationship between the structure and physiologic action of hydrocarbons and their derivatives, nitrogen compounds, oxygen compounds, sulfur compounds, and organo metallic compounds. Laboratory fee, \$18 a semester.
- 226 *Determination of Physical Constants* (2) Schwartz
Lecture (1 hour); laboratory (3 hours). A laboratory and lecture study of the determination of physical constants of medicinal products. Laboratory fee, \$18.
- 228 *Food and Drug Analysis* (4) Schwartz, Bliven
Lecture (2 hours); laboratory (6 hours). A study of the composition of some common foods and food products. Laboratory fee, \$18.
- 231 *Pharmacology of Anesthetic Drugs* (4) Leonard
Theoretical consideration of the principles of anesthesiology and laboratory study of the action of anesthetic drugs. Laboratory fee, \$18.
- 234 *Pharmacology of Autonomic Drugs* (4) Leonard
A study of action and interaction of drugs principally influencing the autonomic nervous system. Laboratory fee, \$18.
- 236 *Experimental Toxicology* (4) Leonard
Pharmacological action of toxic drugs correlated with chemical and pathological studies. Laboratory fee, \$18.
- 251-52 *Graduate Seminar* (1-1) The Staff
Current problems and trends in pharmacy. Required of all students registered for the Master's degree.
- 295-96 *Research and Thesis* (arr.) The Staff
Investigations of special problems in the major field of interest and thesis preparation. Semester hours (not to exceed 6) and fees to be arranged.

PHILOSOPHY*

Professor C. E. Gauss (*Executive Officer*); Assistant Professor R. H. Schlagel; Lecturer C. H. Pfuntner

Bachelor of Arts with a major in Philosophy (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69.

Required: in addition to the general requirements for Columbian College stated on pages 81–87, the grade of “pass” for the Philosophy major examination at the end of the senior year. The coordinated knowledge upon which the student will be examined is schematized under the following two general headings: (1) methodology and theory of knowledge and (2) the history of ideas and social philosophy. The Department of Philosophy provides a proseminar (Philosophy 199–200) intended to assist the student in preparing for the major examination.

Master of Arts in the field of Philosophy (Columbian College).—Prerequisite: an undergraduate major in Philosophy at this University or the equivalent, as attested by the passing of this University’s major examination in Philosophy; the following specific courses or the equivalent: Philosophy 111–12, 113, 121–22, and 123

Required: the general requirements of Columbian College as stated on pages 88–91. As much as possible of the required course work must be in third-group courses. Where second-group courses are elected students will be required to do more intensive and extensive work than undergraduates. A general written examination in two areas of Philosophy and an oral examination in the student’s special field will be required in addition to a Master’s thesis of substantial length.

FIRST GROUP

51–52 *Introduction to Philosophy* (3–3)

Academic year—morning and evening; summer 1960—Philosophy 51 (3). A critical introduction to the problems of modern philosophy in relation to scientific and social developments since the Renaissance. This course is not merely intended as an introduction to those courses in philosophy which follow but is a unit complete in itself for those students in other departments interested in the problems of philosophy relevant to modern thought. The Staff

SECOND GROUP

101 *Philosophic Problems in Living Issues* (1)

Fall—afternoon. Selected public issues used as the basis for demonstrating the methods and relevance of philosophical analysis. This course may be re-elected for credit once only. Gauss

111–12 *History of Philosophy* (3–3)

Academic year—evening. The history of western philosophy from early Greece to Kant, seen as the development and modification of the Hellenic cultural pattern. Pfuntner

113 *History of Nineteenth and Twentieth Century Philosophy* (3)

Fall—evening. European philosophy from the time of Kant. “Isms” and ideologies at the root of contemporary thought. Pfuntner

* The Staff of Instruction here listed is for the academic year 1959–60.

- 121-22 *Logic and Scientific Method* (3-3) Gauss
Academic year—morning. *First half*: the elementary principles of valid reasoning with emphasis on developing skill in using these principles, introductory consideration of symbolic logic, the nature of a formal system. *Second half*: general analysis of the methods of investigation and reasoning used in the natural and social sciences, theory of scientific inference, theories of probability.
- 131 *Ethics* (3) Schlagel
Fall—morning. Analysis of ethical judgments, examination of ethical theories and systems, the relation of ethics to social science and psychology.
- 142 *Philosophies Men Live by* (3) Schlagel
1960-61 and alternate years: spring—morning. The influence upon contemporary personal and social problems of the great eastern and western philosophies that have served as guides for everyday living and moulded man's cultures and institutions.
- 151 *The Philosophy of Science* (3) Schlagel
Fall—evening. The relation between scientific and philosophic explanation, the contributions of the sciences to philosophy and philosophy to the sciences, analysis of the main philosophies of science.
- 152 *Epistemology* (3) Schlagel
Spring—evening. Examination of problems related to perception, verification, nature and criteria of truth, difference between *a priori* and *a posteriori* statements, universals, the concept of mind.
- 162 *Aesthetics* (3) Gauss
Spring—evening. The nature of aesthetic experience, problems of appreciation and judgment in the arts, and of the theories and process of artistic creation. Emphasis on contemporary arts and criticism.
- 172 *American Philosophy* (3) Pfuntner
Spring—evening; summer 1960. The philosophies of Peirce, Royce, James, Dewey, and Santayana as representative of American thought.
- 180 *Philosophy of History* (3) Gauss
Fall—evening. Problems of historical knowledge and explanation. Critique of philosophies of history.
- 193 *Topics in Contemporary Philosophy* (3) Gauss
1961-62 and alternate years. Intensive study of one selected topic in contemporary philosophic literature.
- 199-200 *Proseminar: Readings for the Major* (3-3) Schlagel
Academic year—to be arranged. Conferences and group discussions in preparation for field-of-study major examination.
- THIRD GROUP
- 201-2 *Readings and Research* (3-3) The Staff
Academic year—as arranged. Advanced readings and reports. Investigation of special problems.
- 211 *Seminar in Plato* (3) Gauss
Not offered 1960-61. Intensive study of Plato's later dialogues.

- 212 *Seminar in Aristotle* (3) Schlager
Not offered 1960-61. Aristotle's logic, metaphysics, and philosophy of science.
- 213 *Seminar in Seventeenth Century Rationalism* (3) Gauss
Spring—to be arranged. Intensive study of one of the great post-Renaissance systems of rationalism. Topic for 1960-61: Spinoza.
- 214 *Seminar in British Empiricism* (3) The Staff
Not offered 1960-61. Intensive study of one of the great British empiricists.
- 216 *Seminar in Kant* (3) The Staff
Not offered 1960-61. A study of one of Kant's Critiques.
- 299-300 *Thesis* (3-3) The Staff

RELATED COURSE IN ANOTHER DEPARTMENT

Mathematics 101, *Introduction to Mathematical Logic* (3)

PHYSICAL EDUCATION FOR MEN*

Professors W. H. Myers, J. H. Krupa† (*Executive Officer*); Associate Professors R. G. Hanken, V. J. DeAngelis; Lecturers Pat Abernethy, W. D. Thompson

Associates W. J. Reinhart, E. H. Sherman (to March 1, 1960), W. T. Elias (since December 15, 1959)

This department includes all the recognized athletic activities of the men students of the University.

Two years of Physical Education (Physical Education 1-2 and 11-12) are required of all men for graduation, except those students exempt under the regulations stated on pages 55-56.

Upon entering the University, all freshmen or other undergraduate students who have not fulfilled the Physical Education requirements are given a medical examination. Assignments for medical examinations will be given at the time of registration. The students who satisfy the requirements of the medical examination are then given a physical efficiency test in the general bodily skills of agility, endurance, and strength; and in swimming. If the physical efficiency test is passed, the student may elect from the following list of activities:

- Setting-up Exercises (stretching exercises)
- Body Building Exercises (gymnastic apparatus and weight training skills)
- Competitive games and sports
- Swimming (beginner, intermediate, advanced, life saving)

* The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of Physical Education, and the student assumes full responsibility therefor.

The Staff of Instruction here listed is for the academic year 1959-60.

† On sabbatical leave fall semester 1959-60.

If the physical efficiency test is not passed, the student will be assigned to a class for training in the above activities in the order listed.

The Department furnishes gymnasium uniforms and personal equipment upon receipt of a small payment.

Bachelor of Science in Physical Education (School of Education).—Prerequisite: the Physical Education for Men curriculum in the Junior College, see page 73. The requirements for the degree are stated on pages 157-58 and 167-68.

Bachelor of Arts in Education with (1) a major in secondary education combined with a teaching field in Physical Education and (2) a major in elementary education with an area of specialization in Physical Education, see the School of Education separate catalogue.

FIRST GROUP

- 1-2 *Freshman Physical Education (1-1)* The Staff
Academic year—as arranged. Two periods of supervised activity a week.
Locker and towel fee,* \$4.50 a semester.
- 11-12 *Sophomore Physical Education (1-1)* The Staff
Academic year—as arranged. Two periods of supervised activity a week.
Locker and towel fee,* \$4.50 a semester.
- 43-44 *Techniques of Physical Education* DeAngelis, Krupa
Motor Activities (2-2)
Academic year—morning. Fundamental skills, rules, and organization.
Locker and towel fee,* \$4.50 a semester.
- 45-46 *Methods and Materials for Teaching Individual* Hanken,
and Dual Sports in Secondary Schools (2-2) Krupa
Academic year—afternoon. Tennis, golf, swimming, wrestling, badminton,
bowling. Locker and towel fee,* \$4.50 a semester.
- 47 *Introduction to Physical Education (2)* Myers
Fall—morning. An orientation course presenting the problems of physical
education, vocational analysis, scientific foundations, and scope of field.
- 48 *Introduction to Recreation (2)* Hanken
Spring—as arranged. The role of recreation in modern living; current prac-
tices in community recreation work; standards of training, experience, and sal-
ary; types of leadership.
- 49 *Human Anatomy (3)* Stallings
Fall—morning. The structure of the human body. Basic course for phys-
ical education majors. Also open to both men and women not majoring in
Physical Education. Prerequisite: Biology 1-2 or Zoology 1-2.
- 50 *Kinesiology (3)* Lawrence
Spring—morning. A study of the anatomical mechanism of movement,
analysis of the action of muscles in physical education activities. Prerequisite:
an approved course in anatomy.
- 58 *First Aid and Care of Athletic Injuries (2)* DeAngelis
Spring—morning. Prevention and emergency care of injuries of all types,
with special reference to first aid, civil defense, bandaging, and massage. Pre-
requisite: Biology 1-2 or Zoology 1-2.

* The locker and towel fee is required for registration in one or more of the activity courses.

SECOND GROUP

- 101 *Physical Education in the Elementary School* (3) Atwell, Burtner
Fall—evening; spring—afternoon. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, and self-testing activities.
- 103 *History and Principles of Physical Education* (3) Atwell, Krupa
Fall—morning. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.
- 105-6 *Adapted Physical Education and Physical Examinations* (3-3) Lawrence
Academic year—morning. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription of exercises, and program adaptation. Prerequisite: Physical Education 49 and 50.
- 107 *Techniques for Teaching Recreational Dance* (1 to 2) Burtner
Fall—morning. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary-school age and adult groups. Square-dance calling is included. Locker and towel fee,* \$4.50.
- 109-10 *Leadership Organization in the Intramural Program* (2-2) DeAngelis
Academic year—afternoon. Principles of administration, organization, and supervision of intramural activities in the physical education program of the junior high school, senior high school, and college.
- 113-14 *Methods and Practice in Teaching Physical Education Activities* (2 to 4-2 to 4) Hanken and Staff
Academic year—afternoon. Principles and methods applied to learning and teaching physical education activities. Supervised laboratory. Locker and towel fee,* \$4.50 a semester.
- 115-16 *Methods and Materials for Teaching Team Sports in Secondary Schools* (2 to 4-2 to 4) DeAngelis, Hanken
Academic year—morning. Football, basketball, baseball, track and field. Locker and towel fee,* \$4.50 a semester.
- 117 *Methods of Teaching Modern Dance* (1 to 2) Burtner
1960-61 and alternate years: fall—afternoon. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee,* \$4.50.

* The locker and towel fee is required for registration in one or more of the activity courses.

- 118 *Dance Production* (1 to 2) Burtner
1960-61 and alternate years: spring—afternoon. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee,* \$4.50.
- 121 *School and Community Health Programs* (3) Krupa
Fall—afternoon. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1-2 or Zoology 1-2.
- 122 *Methods and Materials for Health Education* (3) Atwell
Spring—evening. Methods and materials for teaching health at each age level. Prerequisite: Biology 1-2 or Zoology 1-2.
- 131 *Tests and Measurements in Physical Education* (3) Krupa
Fall—morning. Critical survey of tests in physical activities, methods of test construction, elementary statistics.
- 132 *Camp Leadership* (1 to 2) Stallings
Spring—afternoon. Survey of outdoor education programs with special emphasis on leadership techniques for counselors.
- 133-34 *Observation and Student Teaching* Myers, Stallings
(3-3 to 6)
First half: fall and spring—as arranged. Second half: fall and spring—as arranged. Assignments are made to schools in Washington and the vicinity. Physical Education 134, student teaching fee, \$50.
- 136 *Survey of Dance History and Dance Forms* (3) Burtner
1961-62 and alternate years. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnologic dance, practice and discussion of fundamental movement techniques, and composition.
- 138 *Organization and Administration of Physical Education* (3) Krupa
Spring—morning and evening. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.
- 151-52 *Recreational Leadership Activities* Abernethy
(1 to 3-1 to 3)
1961-62 and alternate years. Fall semester: basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. Spring semester: basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.
- 161 *Community Organization for Recreation* (3) Thompson
1960-61 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.
- 162 *Administration of Community Recreation Programs* (3) Thompson
1960-61 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

* The locker and towel fee is required for registration in one or more of the activity courses.

PHYSICAL EDUCATION FOR WOMEN*

Executive Officer (effective September 1960): L. M. Stallings

Professors R. H. Atwell (*Executive Officer*), H. B. Lawrence, Elizabeth Burtner†; *Assistant Professors* L. M. Stallings, G. E. Cheney, L. H. George; *Lecturers* Pat Abernethy, W. D. Thompson; *Instructor* C. S. Vaughan; *Associate* M. V. McEwan

Two years of Physical Education (Physical Education 1-2 and 11-12) are required of all women for graduation, except students exempt under regulations stated on pages 55-56. In the fall a complete medical and physical examination is given each student for the purpose of discovering individual needs. Those students whose examinations indicate the desirability of remedial or restricted activity are assigned to a program especially adapted to their needs. This limited program includes moderate sports and individual exercises in small groups under careful supervision.

The required costume for Physical Education classes may be purchased at the University Book Store.

Bachelor of Science in Physical Education (School of Education).—Prerequisite: the Physical Education for Women curriculum in the Junior College, see page 73. The requirements for the degree are stated on pages 157-58 and 168-69.

Within the curriculum leading to the degree of Bachelor of Science in Physical Education there is opportunity for specializing in dance, correctives, or recreation.

Bachelor of Arts in Education with (1) a major in secondary education combined with a teaching field in Physical Education and (2) a major in elementary education with an area of specialization in Physical Education, see the School of Education separate catalogue.

FIRST GROUP

I-2 Freshman Physical Education (1-1)

Academic year: fundamentals of health and physical education—morning and afternoon; activity—morning and afternoon. One period of fundamentals of health and physical education and two periods a week chosen from the activities offered each season.

Fundamentals of health and physical education: one semester on study of the factors involved in the general maintenance of health, efficient use of the body, and fundamentals of movement; one semester on fundamentals of dance.

Activities: badminton, basketball, body mechanics, canoeing, field hockey, recreational dance, golf, modern dance, riding, skating, swimming, synchronized swimming, tennis, bowling, volleyball, softball, lifesaving. Locker and towel fee,‡ \$4.50 a semester.

11-12 Sophomore Physical Education (1-1)

Academic year: two periods a week—morning and afternoon. Two periods a week chosen from the activities offered each season as listed under Physical Education 1-2. Locker and towel fee,‡ \$4.50 a semester.

* The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of Physical Education, and the student assumes full responsibility therefor.

† The Staff of Instruction here listed is for the academic year 1959-60.

‡ On sabbatical leave spring semester 1959-60.

‡ The locker and towel fee is required for registration in one or more of the activity courses.

43-44 *Techniques of Physical Education Motor Activities* (2-2) The Staff

Academic year—as arranged. Fundamental skills, rules, and organization. Locker and towel fee*, \$4.50 a semester.

47 *Introduction to Physical Education* (2) Myers

Fall—morning. An orientation course presenting the problems of physical education, vocational analysis, scientific foundations, and scope of field.

48 *Introduction to Recreation* (2) Hanken

Spring—as arranged. The role of recreation in modern living; current practices in community recreation work; standards of training, experience, and salary; types of leadership.

49 *Human Anatomy* (3) Stallings

Fall—morning. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1-2 or Zoology 1-2.

50 *Kinesiology* (3) Lawrence

Spring—morning. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

51-52 *Methods and Materials for Teaching Physical Education Activities* (2-2) The Staff

Academic year—as arranged. Team sports: basketball, hockey, softball, soccer, speedball, volleyball. Individual and dual sports: badminton, tennis, golf, archery, swimming and diving, lifesaving and water safety. Group gymnastics. Tumbling. Locker and towel fee, \$4.50 a semester.

58 *First Aid and Care of Athletic Injuries* (2) DeAngelis

Spring—morning. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1-2 or Zoology 1-2.

SECOND GROUP

101 *Physical Education in the Elementary School* (3) Atwell, Burtner

Fall—afternoon; spring evening. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, self-testing activities, and body mechanics.

103 *History and Principles of Physical Education* (3) Atwell, Krupa

Fall—morning. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.

105-6 *Adapted Physical Education and Physical Examinations* (3-3) Lawrence

Academic year—morning. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription.

* The locker and towel fee is required for registration in one or more of the activity courses.

tion of exercises, and program adaptation. Prerequisite: Physical Education 49 and 50.

- 107 *Techniques for Teaching Recreational Dance* (1 to 2) Burtner
Fall—morning. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary school age and adult groups. Square-dance calling is included. Locker and towel fee,* \$4.50.

- 109-10 *Leadership Organizations in the Intramural Program* (2-2) DeAngelis

Academic year—afternoon. Principles of administration, organization, and supervision of intramural activities in the physical education program of the junior high school, senior high school, and college.

- 111-12 *Methods and Materials for Teaching Physical Education Activities* (2-2) The Staff

Academic year—afternoon. Continuation of methods and materials in activities listed under Physical Education 51-52. Locker and towel fee,* \$4.50 a semester.

- 113-14 *Methods and Practice in Teaching Physical Education Activities* (2 to 4-2 to 4) The Staff

Academic year—as arranged. Principles and methods applied to learning and teaching physical education activities. Supervised laboratory. Locker and towel fee,* \$4.50 a semester.

- 117 *Methods of Teaching Modern Dance* (1 to 2) Burtner

1960-61 and alternate years: fall—afternoon. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee,* \$4.50.

- 118 *Dance Production* (1 to 2)

1960-61 and alternate years: spring—afternoon. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee,* \$4.50.

- 121 *School and Community Health Programs* (3) Krupa

Fall—afternoon. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1-2 or Zoology 1-2.

- 122 *Methods and Materials for Health Education* (3) Atwell

Spring—evening. Methods and materials for teaching health at each age level. Prerequisite: Biology 1-2 or Zoology 1-2.

- 131 *Tests and Measurements in Physical Education* (3) Krupa

Fall—morning. Critical survey of tests in physical activities, methods of test construction, elementary statistics.

- 132 *Camp Leadership* (1 to 2) Stallings

Spring—afternoon. Survey of outdoor education programs with special emphasis on leadership techniques for counselors.

* The locker and towel fee is required for registration in one or more of the activity courses.

- 133-34 *Observation and Student Teaching* Stallings, Myers
(3-3 to 6)
Academic year—as arranged. Assignments are made to schools in Washington and the vicinity. Physical Education 134, student-teaching fee, \$50.
- 136 *Survey of Dance History and Dance Forms* (3) Burtner
1961-62 and alternate years. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnologic dance, practice and discussion of fundamental movement techniques, and composition.
- 138 *Organization and Administration of Physical Education* (3) Stallings, Myers
Spring—morning and evening. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.
- 151-52 *Recreational Leadership Activities* (3-3) Abernethy
1961-62 and alternate years. Fall semester: basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. Spring semester: basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.
- 161 *Community Organization for Recreation* (3) Thompson
1960-61 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.
- 162 *Administration of Community Recreation Programs* (3) Thompson
1960-61 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

PHYSICAL MEDICINE AND REHABILITATION*

Professor C. S. Wise (*Executive Officer*); Assistant Professor John Watt, Jr.; Associates Alvin Knudson, F. L. Wenger

- 150 *Elements of Physical Medicine* The Staff
Spring—as arranged. In arrangement with the Anatomy Department, lectures and demonstrations of the various tests and measurements are employed in the evaluation of physical disability.
- 352 *Advanced Physical Medicine* The Staff
Spring—1 hour a week. Lectures and demonstrations concerning the various techniques, clinical applications of physical medicine and rehabilitation to be integrated with the teaching of the associated medical and surgical specialties.

* The Staff of Instruction here listed is for the academic year 1959-60.

467-68 *Clinical Studies*

The Staff

Academic year—as arranged.
University Hospital.

Clinical teaching and demonstration at the

485 *Research* (arr.)

The Staff

Fall—as arranged.
dents.

Open to medical students and qualified nonmedical stu-

PHYSICS*

Professors G. M. Koehl, Lewis Slack (*Acting Executive Officer*), Herbert Jehle; *Associate Professor* H. H. Hobbs; *Associate Professorial Lecturer* H. H. Landon, Jr.; *Assistant Professor* S. S. Yeandle, Jr.; *Lecturers* Mark Harrison, A. P. Kenyon, J. N. Tevis, DeWitt Fisher, J. M. Harrison, K. F. Oerlein, Herbert Rabin, W. J. Condell, Jr.; *Instructor* M. W. Montzka; *Associate* J. E. Tompkins

Bachelor of Arts or Bachelor of Science with a major in Physics (Columbia College—Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, see pages 69-70. The following courses must be included: Physics 11, 12, 13, 16 and 55; or 11, 14, 15, 16; Chemistry 21; Mathematics 29, 30, and 31.

Students who started work toward a major in Physics prior to the reorganization of the introductory courses in Physics and Mathematics, which went into effect in the fall of 1959-60, may substitute Physics 5, 6, and 7 for Physics 11, 12, and 13; and Mathematics 19 and 20 for Mathematics 29, 30, and 31.

Required, for both the Bachelor of Arts degree and the Bachelor of Science degree: the general requirements of Columbia College as stated on pages 81-87, including Mathematics 112 and Physics 101, 105, 106, 113, and 153, 155, or 156, plus two of the following: Physics 102, 118, 123, and 132.

Master of Arts or Master of Science in the field of Physics (Columbia College).—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Physics at this University, or the equivalent. Required: the general requirements as stated on pages 88-91. The thirty hours of required work must include Mathematics 171 (if not taken earlier) and Physics 211-12, 219, 255 or 256, and 291-92.

Doctor of Philosophy (Graduate Council).—See page 97.

Bachelor of Science in Engineering with an option in Physics (School of Engineering).—For requirements, see pages 132-34 and 136-37.

Bachelor of Arts in Education with a teaching field in Physics (School of Education).—Prerequisite: the Education curriculum, page 72.

Required: the physics option, pages 164-65; and the professional courses listed on pages 166-67.

FIRST GROUP

8 *General Physics* (3)

Hobbs

Summer 1960. This course, the fourth in the former sequence of courses in introductory physics (5, 6, 7, 8) will be offered for the last time in the summer of 1960 and is limited to students who have had Physics 7 or 13. Topics

* The Staff of Instruction here listed is for the academic year 1959-60.

considered include electromagnetic waves, light, radio, and X-rays; atomic and molecular structure; radioactivity; nuclear physics; the quantum theory of matter and radiation; and the elementary particles such as electrons, protons, neutrons, and mesons. Prerequisite: Physics 6 or 12 and 7 or 13.

11 *Introductory Physics* (3)

Koehl and Staff

Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Fall—morning, afternoon, and evening. Spring: lecture—morning and evening; recitation—morning, afternoon, and evening; laboratory—morning, afternoon, and evening. Summer 1960. An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by nonscience students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Material fee, \$11.

12 *Introductory Physics* (3)

Koehl and Staff

Spring: lecture (1 hour), recitation (1 hour), laboratory (2½ hours)—morning, afternoon, and evening; summer 1960. Mechanics, wave-motion, and sound. Prerequisite: Physics 11 (or former Physics 5). Material fee, \$11.

13 *Introductory Physics* (3)

The Staff

Fall: lecture (1 hour), recitation (1 hour), laboratory (2½ hours)—morning, afternoon, and evening; summer 1960. Elementary electricity and magnetism. Prerequisite: Physics 11 (or former Physics 5). Material fee, \$11.

14 *General Physics* (3)

Slack and Staff

Spring: lecture (1 hour), recitation (1 hour), laboratory and conference (2½ hours)—morning, afternoon, and evening. Mechanics, wave motion, and sound. Prerequisite: Physics 11. Prerequisite or concurrent registration: Mathematics 29. Material fee, \$11.

15 *General Physics* (3)

Hobbs and Staff

Fall: lecture (1 hour), recitation (1 hour), laboratory and conference (2½ hours)—morning, afternoon, and evening. Electricity and magnetism. Prerequisite: Physics 14. Prerequisite or concurrent registration, Mathematics 30. Material fee, \$11.

16 *General Physics* (3)

Jehle

Spring: lecture (2 hours), conference (1 hour)—morning and evening. Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30, and consent of the instructor.

55 *Physical Measurements* (3)

Slack and Staff

Fall: lecture (2 hours), laboratory (3 hours)—afternoon and evening. Theory and methods of precise measurements in the several fields of physics. Prerequisite: Physics 11 and 12, Mathematics 29. Material fee, \$11.

SECOND GROUP

101 *Mechanics* (3)

1960-61 and alternate years: fall—evening; 1961-62 and alternate years: fall—morning. Statics, elasticity, dynamics of solids and fluids, and gravitation. Prerequisite: Physics 12 (or former Physics 6) or 14, Mathematics 31 or 20.

102 *Heat and Thermodynamics* (3)

Yeandle

Fall—evening. Fundamental concepts, heat transfer, the laws of thermodynamics with applications to physical systems. Prerequisite: Physics 16 or 8, Mathematics 31 or 20.

- 105 *Principles of Electricity* (3) Slack
1960-61 and alternate years: fall—morning; 1961-62 and alternate years: fall—
evening. Elementary d-c and a-c circuit theory, electric and magnetic fields,
dielectric and magnetic materials, motion of charged particles in electric and
magnetic fields. Prerequisite: Physics 16 or 8, Mathematics 31 or 20.
- 106 *Optics* (3) Koehl
1960-61 and alternate years: spring—morning; 1961-62 and alternate years:
spring—evening. Geometrical optics; elementary theory of wave motions;
interference, diffraction, polarization, and dispersion of light; laws of black-
body radiation. Prerequisite: Physics 16 or 8, Mathematics 31 or 20.
- 113 *Atomic Physics* (3) Hobbs
1960-61 and alternate years: fall—morning; 1961-62 and alternate years: fall—
evening. Properties of elementary particles, interactions with radiation,
atomic structure, optical and X-ray spectra, introduction to wave mechanics.
Prerequisite: Physics 16 or 8, Mathematics 31 or 20.
- 114 *Statistical Physics* (3) Jehle
1961-62 and alternate years. Classical and quantum statistics with em-
phasis on Maxwell-Boltzmann statistics; applications to kinetic theory of gases,
gaseous diffusion, specific heats of gases and solids. Prerequisite: Physics 16
or 8, Mathematics 31 or 20, permission of the instructor.
- 116 *Quantum and Solid State Physics* (3) Hobbs
Fall—evening. Primarily for engineers. Prerequisite: Physics 16, Mathe-
matics 111.
- 118 *Introduction to Solid State Physics* (3) Hobbs
1960-61 and alternate years: spring—evening; 1961-62 and alternate years:
spring—morning. Dielectric and magnetic properties of solids, electron the-
ory of metals, semiconductors, dislocations, and plastic flow. Prerequisite:
Physics 113.
- 123 *Nuclear Physics* (3) Slack
1960-61 and alternate years: spring—morning; 1961-62 and alternate years:
spring—evening. Structure and stability of atomic nuclei, nuclear transfor-
mations and reactions, radiations of nuclei, fission. Prerequisite: Physics 113.
- 128 *Sound* (3) M. Harrison
1961-62 and alternate years; summer 1960. Production, propagation, and
detection of sound waves; vibrations of sounding bodies; acoustic instruments
and acoustic measurements. Prerequisite: Physics 16 or 8, Mathematics 31
or 20.
- 132 *Electronics* (3)
Lecture (2 hours), laboratory (3 hours). 1960-61 and alternate years: spring
—morning; 1961-62 and alternate years: spring—evening. The phenomena
of electron emission from solids, the physical properties of electron tubes, and
the principles underlying their basic applications. Prerequisites: Physics 16 or
8 and 55, and a course in d-c and a-c circuits in Physics or Engineering. Ma-
terial fee, \$11.
- 153 *Advanced Laboratory in Atomic Physics* (3) Slack
Spring: Saturday—as arranged. Prerequisite: Physics 16 or 8, 55. Mate-

155 *Advanced Laboratory in Electricity and Magnetism* (3)

Spring: Saturday—as arranged. Prerequisite: Physics 55, 105. Material fee, \$11.

156 *Advanced Laboratory in Optics* (3)

Spring: Saturday—as arranged. Prerequisite: Physics 55, 106. Material fee, \$11.

181 *Biophysics* (3)

Spring—evening. Molecular basis of biophysics, biosynthesis, and reproduction. Molecular and genetic aspects of the effects of radiation. Physiochemical equilibria, steady states, and transients in biological systems; order, disorder, and information theory. Admission by permission of the instructor.

191 *Nuclear Reactors* (3)

Fall—evening. Neutron physics: sources of neutrons, neutron reactions, slowing down and diffusion; introduction to transport theory; fission process; reactor types; basic theory of homogeneous and heterogeneous reactors, including specific numerical studies from recent publications. Prerequisite: Physics 16 or 8; Mathematics 31 or 20.

THIRD GROUP

211 *Classical Physical Theory* (3)

Fall—evening. Dynamics of systems of particles and of rigid bodies, generalized coordinates. Prerequisite: Physics 101; Mathematics 112 or 132, 171. (Mathematics 171 may be taken concurrently.)

212 *Classical Physical Theory* (3)

Spring—evening. Classical nonrelativistic and relativistic field theories. Prerequisite: Physics 101 and 105; Mathematics 132, 171.

219-20 *Wave Mechanics* (3-3)

Academic year—evening. Criticism of classical ideas of mechanics and a formulation of wave-mechanical equations; matrix mechanics and its relation to wave mechanics; application to various problems of atomic, molecular, and nuclear physics. Prerequisite: Physics 113, 211, 212.

222 *Quantum Electrodynamics and Field Theories* (3)

Not offered 1960-61. Relativistic wave equation, quantization of electromagnetic fields, interaction between matter and radiation, elementary particles and their transformations. Prerequisite: Physics 219-20.

227 *Statistical Thermodynamics* (3)

Spring—evening. Axiomatic formulation of thermodynamics. Thermodynamics potentials and equilibria. The method of Gibbs. Statistical theory based on indistinguishability of particles. Bose-Einstein and Fermi-Dirac statistics. Applications to radiation, electron, gases, etc. Prerequisite: Physics 102, 114; Mathematics 132.

255-56 *Graduate Laboratory* (4-4)

First half: not offered 1960-61. Second half: Saturday—as arranged. Individual work on special topics. One semester of this course is required of all Master's candidates in physics. Students electing this course may begin with Physics 255 or 256. Not open to undergraduates. Material fee, \$11 a semester.

- 291-92 *Seminar: Recent Developments in Physics (1-1)* The Staff
Academic year: alternate weeks—Monday evening. Individual investigations of special problems. All students registered for a Master's degree in physics are expected to attend this seminar during residence for the degree, and to take part in its programs. Credit for participation in the seminar work is obtained by registering for this course during the last two semesters of residence; this credit, however, is based upon the seminar work during the entire period of residence.
- 299-300 *Thesis (3-3)* The Staff
Academic year—as arranged. Fees to be arranged.

PHYSIOLOGY*

Professors C. E. Leese, C. A. M. Hogben (*Executive Officer*), W. R. Duryee (*Research*); Associate Professors E. M. Renkin, F. P. J. Diecke; Assistant Professors Ruth McClintock, C. S. Tidball (*Research*); Lecturers J. F. Hoffman, D. P. Rall, Eugene Braunwald; Associates Saul Winegrad, P. G. Linaweaver, Jr., D. M. Nicholls, R. J. Gumnit, M. E. Westecker, M. E. Tidball

Special Lecturer S. J. Sarnoff

Master of Arts or Master of Science in the field of Physiology (Columbia College).—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Biology, Chemistry, Physics, or Zoology from this University, or the equivalent. The undergraduate work should include introductory zoology, chemistry, and physics. It should be supplemented by further courses in mathematics and science such as calculus, physical and organic chemistry.

Required: the general requirements of Columbia College as stated on pages 88-91. In addition to the thesis, the thirty hours of required work should include Physiology 221 or 222, 231, and at least three credit hours of research (Physiology 295 or 296). Biochemistry 221-22 is required unless it was included in the undergraduate program.

Doctor of Philosophy (Graduate Council).—See page 98.

115 Physiology (3)

Fall: section A—Tues. and Thurs., 8:45 to 10:00 A.M.; section B—Tues. and Thurs., 5:10 to 6:25 P.M. Lectures for nonmedical students covering the fundamentals of physiology in its various subdivisions. Prerequisite: one year of general science or one semester of a biological science. Prerequisites and time subject to change 1960-61.

117 Experimental Physiology (1)

Fall—Fri., 2:10 to 5:10 P.M. Laboratory exercises in the fundamentals of physiology for nonmedical students. Prerequisite or concurrent registration: Physiology 115; or the equivalent. Material fee, \$18. Prerequisites and time subject to change 1960-61.

* The Staff of Instruction here listed is for the academic year 1959-60.

120 *Physiology of Endocrine Activity* (2)
Not offered 1960-61. For nonmedical students. The circulatory, metabolic, reproductive growth, and other adaptations immediate and long term; accompanying and affecting endocrine activity. Prerequisite: Physiology 115 or the equivalent.

130 *The Psycho-physiology of Personality* (2) Leese
Spring—Tues. and Thurs., 5:10 P.M. For nonmedical students. Lectures on the genesis and expression of personality, with emphasis on the physiological approach. Prerequisite: Physiology 115 or the equivalent and general psychology.

149-50 *Medical Physiology* Hogben and Staff
Fall—4 hours a week; spring—14 hours a week. Lectures and laboratory work in all divisions of Physiology. This course is designed for medical students.

211-12 *Problems in Physiology* (arr.) Leese
Academic year—as arranged. For nonmedical graduate students. Open to undergraduate students with the approval of the Department. Prerequisite: Physiology 115 and 117, or the equivalent.

221-22 *Physiology Seminar* (1-1) Renkin
Academic year—1 hour a week, as arranged. For nonmedical students undertaking graduate work in physiology. Prerequisite: Physiology 115 and 117, or the equivalent.

231-32 *Advanced Physiology* (6-6) Renkin and Staff
A year course; credit is not given for the first half until the second half is completed. Fall—4 hours a week; spring 14 hours a week, as arranged. For nonmedical graduate students. Lectures and laboratory work in all major areas of physiology. Physiology 232: material fee, \$42.

249-50 *Introduction to Medical Research** (3-3) The Staff
Academic year—Sat., 8:00 A.M. to 1:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

269-70 *Pharmacologic Physiology* (1-1) The Staff
Academic year—one hour a week, as arranged. Recent advances in physiology and pharmacology for those interested in research. Open to qualified medical and nonmedical students.

279 *Topics in Physiology* (1) The Staff
Fall—one hour a week, as arranged. Review of the active areas of research. Open to qualified medical and graduate students. Prerequisite: Physiology 150 or 232.

295-96 *Research* (arr.)
Academic year—as arranged.

299-300 *Thesis* (3-3) The Staff

The Staff

* This is an interdepartmental course. The student should register in the department directing his research.

POLITICAL SCIENCE*

Professors W. R. West, J. W. Brewer (*Executive Officer*), W. H. Kraus; *Professorial Lecturers* F. M. Riddick, R. D. Potts; *Associate Professor* H. L. LeBlanc; *Associate Professorial Lecturer* R. A. Kinney; *Assistant Professor* H. R. Ludden; *Lecturers* William Spencer, C. H. Slayman, Jr.

Bachelor of Arts with a major in Political Science (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College stated on page 69, including Political Science 9-10.

Required: in addition to the general requirements of Columbian College stated on pages 81-87, thirty semester hours from the following groups distributed as follows: twelve hours from Group A; six hours from group B; six hours from Group C; and six additional hours from any group or groups. The student will normally complete all six hours of any full-year course which he selects.

Group A: Political Science 111, 112, 117-18, 121-22. Group B: Political Science 171, 172, 181-82. Group C: Political Science 104, 125, 145, 146, 151-52. Group D: 105, 107, 113, 120, 141, 157-58, 177-78, 187-88, 191-92, 194.

Undergraduate students interested in preparing for graduate work in Political Administration will consult the Executive Officer of the Department of Political Science for modifications of the above requirements.

Bachelor of Arts with a major in Latin American Civilization (Columbian College—Field-of-Study).—See the Department of History, pages 292-93.

Master of Arts in the field of Political Science (Columbian College).—Prerequisite: a Bachelor of Arts degree with a major in Political Science at this University, (or the equivalent major elsewhere) with a B average (or better) in the major.

Required: the general requirements of Columbian College as stated on pages 88-91. The thirty hours of required work must be approved in advance by the Adviser.

Master of Arts in the field of Latin American Civilization (Columbian College).—See the Department of History, page 293.

Doctor of Philosophy (Graduate Council).—See page 96.

Bachelor of Arts and Master of Arts in Government in the fields of Foreign Affairs and Public Affairs (School of Government).—See pages 179-82, 185-88.

FIRST GROUP

1 *Introduction to Government*† (3)

Fall—evening; spring—morning. Basic principles and problems of political life: theories, forms, and processes of government in the United States and foreign countries. Attention is also given to international relations.

9-10 *Government of the United States*† (3-3)

First half: fall—morning and evening; spring—morning; summer 1960. *Second half:* fall—morning; spring—morning and evening; summer 1960.

First half: structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. *Second half:* state and local governments; civil rights; major functions of government at federal, state, and local levels.

* The Staff of Instruction here listed is for the academic year 1959-60.
† Six hours of first-group Political Science courses are prerequisite to all second-group courses.

SECOND GROUP*

- 104 *State and Local Governments* (3) LeBlanc
1961-62 and alternate years. State, municipal, and other local governmental forms, operations, and problems, with attention to policy formulation and administration, and to the forces of practical politics. Not open to students who have credit for former Political Science 115.
- 105 *The Governmental Process of the District of Columbia* (3) LeBlanc
Not offered 1960-61. Legal structure and political problems of the District of Columbia including restrictions on home rule, Congressional relations, and group politics.
- 107 *Problems in Modern Political Thought* (3) Kraus
Spring—morning; summer 1960. Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries.
- 111 *Introduction to Comparative Government* (3) Kraus
Fall—morning. Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France.
- 112 *Introduction to Comparative Government* (3) Kraus
Spring—morning. Government and politics of the principal political systems of Central and Eastern Europe: Germany and the Soviet Union.
- 113 *Political Problems of the British Commonwealth of Nations* (3) Kraus
Summer 1960. From Colonial Empire to modern Commonwealth: questions of equal partnership; governments and policies in the principal Commonwealth states; problems of new states.
- 117-18 *Political Theory: the Growth of Political Thought in the West* (3-3) Kraus
Academic year—evening. *First half*: from Classical Antiquity to the Middle Ages; the forging of the western political tradition. *Second half*: from the Renaissance and Reformation to recent times. Theoretical foundations of the modern state: morals and politics, sovereignty, absolutism, and resistance; liberalism, democracy, and conservatism.
- 120 *Foundations of American Democracy* (3) Brewer
1960-61 and alternate years: spring—morning. Introduction to political thought in the United States from colonial times to the end of the Civil War period.
- 121-22 *The Constitution of the United States* (3-3) West
Academic year—evening; summer 1960—Political Science 121 (3). Judicial power of federal courts in constitutional interpretation. *First half*: emphasis on separation of powers, federal-state relationships, and taxation. *Second half*: emphasis on constitutional protection of civil rights.
- 125 *Legislative Organization* (3) Riddick
1961-62 and alternate years. A study of Congress: constitutional aspects, legal analysis of make-up, and political organization. Political and parliamentary.

* Six hours of first-group Political Science courses are prerequisite to all second-group courses.

tary procedures used in the preparation and enactment of legislation. Not open to students who have credit for former Political Science 124.

- 141 *The Development of Legal Institutions* (3) Brewer
1961-62 and alternate years. Introduction to historical jurisprudence; primary attention to the origins of the Roman Law of Continental Europe and of the Anglo-Saxon Common Law.

- 145 *Political Parties and Politics* (3) LeBlanc
Fall—evening; summer 1960. Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence on President and Congress. Not open to students who have credit for former Political Science 116.

- 146 *Political Pressures and Public Reactions* (3) Ludden
Spring—evening. Public opinion, special interest lobbies, and pressure groups as they operate on government to influence public policy.

- 151-52 *Public Administration* (3-3) LeBlanc
Academic year—morning. Introductory survey of the theory and practice of governmental administration and its relation to politics, legislation, the courts, and nongovernmental organizations and interests.

- 157-58 *Current Problems in Domestic Politics* (1-1) Slayman
Academic year—evening. Analysis of outstanding contemporary issues in internal American politics with discussion of problems and policies.

- 166 *Field Work in Government* (3) LeBlanc
Fall—as arranged; spring—as arranged. Practical training in the operation of the Federal Government, based on experience through assignment to selected government offices. Students will have an opportunity to observe and participate in government in the Washington area. Open only to students in the Public Affairs curriculum, School of Government.

- 171 *International Politics* (3) Ludden
Fall—morning and evening; summer 1960. Basic forces underlying the conduct of international relations and the formation of foreign policy; power politics, imperialism, collective security, and international cooperation.

- 172 *International Organization: the United Nations* (3) Ludden
Spring—morning and evening; summer 1960. Development and current operation of international organization within the system of sovereign states with emphasis on the United Nations.

- 177 *Recent Trends in Latin American Politics and Government* (3) Davis
Fall—morning. Types of government, recent developments, and current political conditions in each of the twenty Latin American republics. May not be taken by students who have credit for former Political Science 176.

- 178 *International Politics in the Western Hemisphere* (3) Davis
Spring—morning; summer 1960. Political relations of the American Republics in the 19th and 20th centuries, the development of Pan Americanism and the Organization of American States. May not be taken by students who have credit for former Political Science 175.

- 181-82 *International Law* (3-3) Brewer
 Academic year—morning and evening; summer 1960—Political Science 181 (3). Survey of the public law of nations with emphasis on the law of peace. Neutrality and the so-called law of war receive attention in the second semester.
- 187-88 *Current Problems in International Politics* (1-1) Slayman
 Academic year—evening. Analysis of outstanding contemporary international issues with discussion of problems and policies.
- 191-92 *Government and Politics in the Middle East* (3-3) _____
 Academic year—morning. *First half*: international relations and governmental problems of the Arab world and Israel. *Second half*: international relations and governmental problems of new nations of Central Africa and Southern Asia.
- 194 *Far Eastern Politics: Contemporary International Relations in the Pacific Area* (3) Kinney
 Spring—evening. Background and development of the major states of East Asia with attention to the constitutional systems and the foreign politics of the region.
- 197 *Proseminar in Foreign Affairs* (3) _____
 Fall—morning; spring—evening. Reading and discussion course for co-ordination and review. Primarily for seniors in the Foreign Affairs major.

THIRD GROUP

- 205-6 *The Federal Executive* (3-3) _____
 1960-61 and alternate years: academic year—evening. *First half*: nomination and election of the U. S. President, his constitutional and political powers; the cabinet and the Executive Office of the President; the relation of the President to the executive and legislative branches of the government. *Second half*: the practical politics of the presidency, presidential policy leadership and control, the President as party head and as moulder of public opinion.
- 209-10 *Seminar: the Federal Government of the United States* (3-3) West
 1961-62 and alternate years. Advanced research emphasizing legislative problems of Congress and relations of Congress with the Administration.
- 212 *Seminar: Comparative Government* (3) Kraus
 1960-61 and alternate years: fall—evening; summer 1960. Selected topics and problems on comparative political and administrative institutions and the politics of modern constitutional governments and dictatorships. Each semester is devoted to a selected country or significant institutional or policy problem.
- 213 *Readings in Comparative Government* (3) Kraus
 Spring—evening. Readings and group discussions on comparative political and administrative institutions with attention to legislatures, the changing role of the executive, political parties, constitutional and totalitarian approaches to public management and public service, the role of the military, etc.
- 217 *Seminar: Topics in Political Theory* (3) Kraus
 1961-62 and alternate years. Research and discussion on problems of modern political and constitutional theory, theoretical aspects of representative

government, democracy, socialism, and totalitarianism. Each semester is devoted to a separately announced topic, such as socialism and communism, theories of resistance and revolution, problems of democratic theory.

220 *Reading Course in Political Theory* (3)

1960-61 and alternate years: fall—evening. Readings and group discussions, principally on modern political and constitutional theory since the 17th and 18th centuries. Kraus

221-22 *Seminar: The Constitution of the United States* (3-3)

1960-61 and alternate years: academic year—evening. Selected topics in the development of the law of the Constitution. Primary attention will be given to the development of "due process of law" in the courts. West

245-46 *The American Political Process: Political Parties and Interest Groups* (3-3)

Academic year—evening. First half: readings and group discussions on the nature and functions of political parties and the role and techniques of political interest groups. Second half: seminar on selected topics of American politics requiring the use of basic research materials. LeBlanc

271-72 *Problems in International Politics and Organization* (3-3)

Academic year—afternoon. A seminar to develop techniques of research in recent international affairs and to examine developments in international politics and organizations. Ludden

273 *Public Opinion and Foreign Policy* (3)

Fall—evening. Development, organization, and operation of international information programs by major world powers. Public opinion in the United States influencing the formation and conduct of foreign policy. Ludden

274 *Methods and Objectives of Foreign Policy* (3)

Spring—evening. Examination of the objectives of foreign policies of the major powers, with attention to political, economic, and military methods used to pursue these objectives. Davis

277 *Seminar: Latin American Government* (3)

Fall—evening. Analysis of the political structures of selected Latin American republics. Two comparable governments studied each year. Davis

278 *Seminar: Latin American Political Philosophy* (3)

Spring—evening. Research in political personalities and philosophies of 19th and 20th century Latin America. Davis

279 *Reading Course in International Affairs* (3)

Fall—evening; summer 1960. Reading and discussion of basic materials designed to stimulate investigation of problems in the nature and development of international law, politics, and organization. Brewer

281-82 *Seminar: International Law and Relations* (3-3)

First half: summer 1960. Second half: fall—evening. Research topics in the public law of nations, with special attention to problems of pacific settlement, sanctions, war, neutrality, and state jurisdiction, and to their political implications. Brewer

- 292 *International Politics and Government in the Middle East* (3)
 Spring—evening. Research and analysis of the international relations and major political problems of the Arab world and adjacent areas.

- 293-94 *Seminar: International Politics and Government in the Pacific Area* (3-3) Kinney
 Academic year—evening. Research and analysis of the major patterns of development in internal and international politics of the area, with advanced study of the governmental institutions of the Far East.

- 299-300 *Thesis* (3-3) The Staff
 Academic year—as arranged; summer 1960.

COURSE OFFERED IN SPECIAL PROGRAM

In addition to the regular courses announced above the University offers the following course, which is available to students enrolled in the Air Force Advanced Management program. Others admitted only by special permission of the Executive Officer.

- 287 *American Military Policy* (3) Potts
 Examination of the nature of military policy and its relation to domestic and foreign policy, the historical element, organization within the military establishment for policy making.

PSYCHIATRY*

Professors Winfred Overholser (*Emeritus*), Leon Yochelson (*Executive Officer*); *Clinical Professor* Joel Elkes; *Associate Clinical Professors* H. P. Laughlin, M. deG. Ruffin, Sidney Berman, Morris Kleinerman, Elmer Klein, A. C. Todd, Norman Taub, J. D. Schultz; *Assistant Professor* J. E. Rankin; *Assistant Clinical Professors* Harold Corson, S. S. Tenenblatt, Richard Schaengold, Leon Ferber, P. H. Gray; *Associates* David Eden, R. M. Greenberg, Helen Pallister, C. T. Bever, W. C. Johnson; *Clinical Instructors* R. A. Rogers, J. A. Farrell, W. D. Kehne, H. A. Meyersburg, S. C. Gordon, H. B. Lehrman, R. A. Frank, Maxwell Boverman, H. G. Percy, A. M. Drummond, G. W. Sprehn, N. C. Rintz, Leslie Schaffer, J. L. Sheridan, L. J. Duhl, G. W. Metcalf, M. E. Perkins, S. L. Werkman, D. W. Harris, A. H. Kiracofe, T. M. Mackenzie, B. W. Murphy, Daniel Prager, F. N. Waldrop

- 165 *Introductory Medical Psychology* Berman
 Fall—1 hour a week. An orientation course in the anatomical, physiological, and psychological growth and development of personality. Consideration of characteristics of structure, function, and development of the psyche lead-

* The Staff of Instruction here listed is for the academic year 1959-60.

ing to normal behavior as a basis for the study of the pathological. Evaluation of interpersonal relationships.

178 *Psychopathology*

Spring—1 hour a week. Manifestations and understanding of various mental mechanisms and abnormal reaction-types, preceded by history of development of psychopathology and illustrated with case material. Rankin

266 *Psychiatry*

Spring—1 hour a week. History, etiology, symptoms, course, and treatment of the major psychoses with emphasis on the dynamics involving the person as a whole. Overholser

268 *Demonstration Clinics*

Spring—3 hours a week. Presentation of clinical cases of major mental illnesses and primary behavior disturbances, correlating with Psychiatry 266. Each student examines patients under supervision. St. Elizabeths and D. C. General hospitals. Taub, Tenenblatt, Schaengold

272 *Psychosomatic Aspects of General Medicine*

Spring—1 hour a week. Somatic disorders of psychogenic origin. The role of personality reactions in functional and organic disorders. Ruffin

324 *Psychoneurosis*

Spring—1 hour a week. Etiology, psychopathology, clinical aspects, and treatment of various types of psychoneuroses. Medical Conference Room, D. C. General Hospital. Ferber

431-32 *Clinical Clerkship*

Three weeks divided service as arranged during academic year. Supervised examination, diagnosis, and treatment of ambulatory borderline cases in University Hospital and hospitalized cases in St. Elizabeths Hospital. Conferences for discussion of cases. Clinical application of psychiatric principles to general medical practice is stressed. University Hospital Inpatient and Outpatient Psychiatric clinics and St. Elizabeths Hospital. The Staff

PSYCHOLOGY*

Professors Mitchell Dreese, Thelma Hunt (*Executive Officer*), D. C. Faith; *Professorial Lecturers* H. F. Hubbard, Margaret Ives; *Associate Professors* C. E. Tuthill†, W. E. Caldwell, J. N. Mosél, R. D. Walk; *Assistant Professor* E. M. Johnson; *Lecturer* C. J. Lindley; *Associate* W. R. Kotapish

Bachelor of Arts with a major in Psychology (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69, including Psychology 1, and 4 or 22 or 29.

* The Staff of Instruction here listed is for the academic year 1959-60.

† On sabbatical leave 1959-60.

The general requirements for the degree are stated on pages 81-87. The sixty required semester hours must include twenty-seven hours in Psychology in addition to those taken as prerequisites, including Psychology 98, 118, 131, 151 or 171, 191, and 196; and Statistics 53.

Master of Arts or Master of Science in the field of Psychology (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Psychology at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91. Of the twenty-four required semester hours (exclusive of the thesis), a minimum of eighteen must be in third-group courses; a minimum of twelve must be in psychology including Psychology 201 and 202; twelve may be in related fields approved by the Department.

Master's programs are available in the following fields of concentration: (1) tests and measurements, (2) counseling and guidance, (3) clinical-abnormal, (4) social, (5) personnel, (6) experimental, and (7) personality. For detailed requirements consult the Executive Officer of the Department.

Doctor of Philosophy (Graduate Council).—See page 97.

Bachelor of Arts in Government with a major in Business Administration (Personnel Management option) (School of Government).—See pages 74, 179-80, 182.

Master of Arts in Personnel Administration or Master of Arts in Government with a specialty in Counseling, Psychometrics, or International Communication (School of Government).—See pages 191, 185-87, 187, 188-89.

Master of Arts in Education in the fields of Employee Training and of Guidance (School of Education).—Prerequisite: a Bachelor's degree from an accredited institution and two years of successful teaching experience. The requirements for the degree are stated on pages 170-72.

FIRST GROUP

1 *General Psychology** (3)

Fall—morning and evening; spring—morning and evening; summer 1960. The Staff
The fundamental principles underlying human behavior.

4 *Psychology of Adjustment* (3)

Fall—morning and evening; spring—morning and evening; summer 1960. The Staff
Processes involved in the total adjustment of the individual with emphasis on social environment; development in the individual of adjustment techniques.

22 *Introduction to Educational Psychology* (3)

Fall—evening; spring—morning; summer 1960. Lindley, Faith
and group differences, adjustments, and the psychology of learning in relation to education and training. Consideration of individual

29 *Child Psychology* (3)

Fall—morning; spring—evening; summer 1960. Johnson
study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world. A genetic approach to the

98 *Abnormal Psychology* (3)

Fall—morning and evening; spring—morning; summer 1960. Hunt
diagnosis, treatment, and prevention of the various types of maladjustments and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science. The causes,

* Psychology 1 is prerequisite to all other courses in Psychology.

SECOND GROUP*

- 112 *Adolescent Psychology* (3) Johnson
Fall—morning. Psychological characteristics and problems peculiar to adolescence, with emphasis on applications of psychology to solution of such problems.
- 118 *Physiological Psychology* (3)
Fall—evening; spring—morning. Structure, function, and phylogeny of receptors, nervous system, and effectors as mediators of behavior, including drives, learning, and emotions.
- 121 *Educational Psychology* (3) Lindley
Spring—evening. Advanced course in educational psychology. Designed for those with background in education and psychology.
- 129 *Introduction to Counseling and Guidance* (3) Dreese
Fall—evening; summer 1960. A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.
- 131 *Psychological Tests* (3)
Fall—morning; spring—evening; summer 1960. A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7.
- 141 *Leadership, Group Behavior, and Student Life* (3) Faith
Fall—morning. A survey of the foundations of leadership, of the factors which underlie effective participation in group activities, and of the interrelations between the student and his university.
- 144 *Personnel Psychology* (3) Hubbard, Mosé
Academic year—evening; summer 1960. The applications of psychology to personnel work in education, business, industry, and government.
- 146 *Problems in Human Relations* (3) Caldwell
Spring—morning. The application of psychological principles to understanding and improving personal and group relations. Emphasis will be upon case studies and specific problems drawn from life situations, with important attention to supervisory and administrative relationships. Prerequisite: Psychology 1 (or Psychology 145 for students in the special programs).
- 148 *Psychology of Advertising and Market Research* (3) Mosé
1960-61 and alternate years: fall—afternoon. The motivational and social dynamics of consumer behavior. Evaluation of the psychological effectiveness of products, media, and advertising and public relations programs. Consideration of current techniques and findings in motivational research.
- 151 *Social Psychology* (3) Tuthill
Fall—evening; spring—morning; summer 1960. The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war.
- 156 *Psychology of Propaganda and Public Opinion* (3) Tuthill
Spring—evening. The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare.

* Six credits in first-group courses are prerequisite to all second-group courses.

- 161 *Comparative Psychology* (3) Caldwell
1960-61 and alternate years; spring—morning. A lecture course in animal psychology. Covers psychological processes in infrahuman organisms, evolution of behavior, the place of animal experimentation and research in psychology.
- 162 *Experimental Comparative Psychology* (3) Caldwell
Fall—as arranged; spring—as arranged. Opportunity for individual psychological experimentation using lower animals as subjects. Offered on independent study plan. Prerequisite: Psychology 161 and permission of the instructor.
- 171 *Psychology of Personality* (3) Caldwell
1961-62 and alternate years. Contemporary approaches to the study of personality. Prerequisite: 12 credits in psychology, including Abnormal Psychology.
- 191 *Experimental Psychology* (3) Walk
Fall—afternoon and evening; spring—afternoon and evening. The application of experimental methods to various psychological problems. Prerequisite: 12 credits in psychology and an elementary course in statistics. Material fee, \$10.
- 192 *Problems in Experimental Psychology* (3) Walk
Fall—as arranged; spring—as arranged. Opportunity for work on individual experimental projects. Prerequisite: Psychology 191 and permission of the instructor.
- 193-94 *Readings in Psychology* (3-3) The Staff
Academic year—as arranged; summer 1960—Psychology 193 (3). Supervised readings on specific topics in psychology, with conferences, for undergraduate majors. Open only to seniors with 18 or more credits in psychology with a quality-point index of 3.00 or higher. Admission by special permission of the instructor.
- 196 *History and Systems of Psychology* (3) Caldwell
Fall—afternoon; summer 1960. A survey of the contemporary schools of psychology. Prerequisite: 12 credits in psychology.
- THIRD GROUP*
- 201 *Seminar: Advanced General Psychology* (3)
Fall—afternoon; spring—evening. General review of the field for graduate students with an intensive study of selected problems. Required in all graduate programs.
- 202 *Psychological Research Methods and Procedures* (3) Walk
Fall—evening; spring—afternoon; summer 1960. Required of all Master of Arts candidates in psychology. Prerequisites: Experimental Psychology and an elementary course in statistics.
- 205 *Field Work in Psychology* (3) The Staff
Summer 1960. Supervised field work in agencies providing psychological service. Admission by permission of the Executive Officer of the Department.
- 207-8 *Readings in Psychology for Graduate Students* (3-3) The Staff
Academic year—as arranged; summer 1960—Psychology 207 (3). Supervised readings on specific topics in psychology, with conferences, for graduate students with an intensive study of selected problems. Required in all graduate programs. Admission by special permission of the Executive Officer of the Department.

* Open only to graduate students, except by special permission of Instructor and Executive Officer of the Department.

- vised readings with conferences on specified topics in psychology. Open only to students who have had course work in the field of the readings.
- 209 *Seminar: Psychology of Motivation* (3) Caldwell
Fall—evening. A consideration of various theoretical approaches to the psychology of motivation and systematic concepts and experimental findings deriving from each approach.
- 212 *Seminar: Personality Evaluation by Projective Techniques* (3) Ives
Spring—evening. Primary emphasis upon administration and scoring of the Rorschach Test. Prerequisite: Psychology 233.
- 213 *Seminar: Clinical Psychometrics* (3)
Spring—evening. A study of the clinical applications of nonprojective tests. Prerequisite: Psychology 233.
- 215 *Seminar: Advanced Study of Projective Techniques* (3) Ives
Fall—evening. Primary emphasis upon interpretation of the Rorschach Test. Prerequisite: Psychology 212.
- 220 *Seminar: Abnormal Psychology* (3) Hunt
Spring—afternoon. An intensive study of selected problems in the field of abnormal psychology.
- 223 *Seminar: Learning* (3) Walk
Fall—afternoon. Covers theories of learning.
- 225 *Seminar: Mental Hygiene* (3) Hunt
Fall—afternoon; summer 1960. A study of mental health problems with special attention to programs of prevention.
- 226 *Seminar: Clinical Psychology of Childhood and Adolescence* (3) Johnson
Spring—afternoon. A survey of behavior and personality disorders.
- 227 *Seminar: Counseling and Guidance* (3) Dreese
Spring—evening. Recent developments and current problems in vocational, educational, and personal guidance in various types of agencies with particular reference to education. Prerequisite: educational or psychological measurements and Psychology 129 or the equivalent.
- 228 *Seminar: Techniques of Counseling* (3) Dreese
Fall—evening; spring—evening; summer 1960. An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed.
- 229 *Seminar: Occupational and Educational Information* (3) Faith
Fall—evening; spring—evening. Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and disseminating for purposes of guidance.
- 231 *Test Construction* (3) Hunt
Fall—evening. The principles underlying test construction; statistical techniques in the construction, evaluation, and standardization of psychological.

educational, and vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.

- 232 *Research: Test Construction* (3) Hunt
Fall—as arranged; spring—as arranged. Individual projects in construction and evaluation of psychological, educational, or vocational tests. Prerequisite: Psychology 231 and permission of the instructor.

- 233 *Individual Psychological Testing* (3) Johnson
Fall—afternoon; spring—afternoon. Instruction and practice in giving of the Binet and Wechsler tests. Prerequisite: an elementary course in tests and measurements. Material fee, \$7.

- 234 *Seminar: Test Theory* (3) Mosél
1960-61 and alternate years: fall—evening. The theory underlying test development, construction, evaluation, and application; techniques applicable to problems of test construction and development.

- 235 *Seminar: Psychological Measurement* (3) Hunt
Spring—evening. Advanced instruction in the use and interpretation of psychological tests, with emphasis upon group tests; survey of recent research in psychological measurement. Prerequisite: a course in psychological or educational measurement.

- 236 *Seminar: Analysis of the Individual for Purposes of Counseling* (3) Faith, ———
Fall—evening; spring—evening. A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements.

- 244 *Seminar: Job Analysis and Evaluation* (3) Mosél
Summer 1960.

- 245 *Seminar: Employee Motivation and Morale* (3) Mosél
Spring—evening. Application of the principles of primary group functioning and group-centered administration to the problem of motivating employees; building morale, and strengthening human relations. Emphasis is upon use of group dynamics in supervision and leadership.

- 246 *Seminar: Personnel Measurement Techniques* (3) Mosél
Fall—evening. Detailed consideration of interviews, personal data analysis, tests, ratings, and questionnaires in evaluating employability, job proficiency, and worker morale.

- 249 *Seminar: Human Engineering* (3) ———
Spring—evening. Application of findings and methods of experimental psychology to design and operation of equipment and man-machine systems. Control of capacities of the operator to information display systems, control mechanisms, work environment, and work methods.

- 251 *Seminar: Advanced Social Psychology* (3) Tuthill
Fall—evening. Current research and theory in social psychology; group dynamics, ego-involvements, action research, and social interaction theory.

- 254 *Seminar: Group Dynamics* (3) Tuthill
1961-62 and alternate years. The experimental study of small groups; autocratic and democratic group climates; interaction process analysis; Lewin's field-theoretical approach to individual and group processes.

- 255 *Seminar: Techniques of Opinion and Attitude Measurements* (3) Tuthill
1960-61 and alternate years; spring-evening. Methods of attitude measurement (interviews, questionnaires, scales, polls) as currently used by private and governmental investigators. The place of attitude studies in schools, industry, government, etc.
- 258 *Applied Social Psychology* (3) Mosel
Spring-evening. The development of personality, personality adjustment, nature of communication and interaction; structure and functioning of groups, group dynamics, opinion and attitude formation, and opinion and attitude measurement. Classroom activity supplemented by practical observations and projects. Open only to graduate students in hospital administration, engineering administration, and other graduate administrative programs.
- 261 *Seminar: International Communication* (3) Mosel
1961-62 and alternate years. The communication process, problems in mass communication, measuring and modifying opinions and attitudes, principles of persuasion, psychological warfare.
- 272 *Seminar: Theories of Personality* (3) Caldwell
Fall-evening. A survey of the various theories of personality, with emphasis upon theoretical problems and methodology in the field of personality study.
- 281-82 *Practicum in Counseling* (3-3) The Staff
Academic year—as arranged. Supervised practical instruction in agencies doing counseling. Prerequisite: graduate work in counseling. Admission by permission of the Executive Officer of the Department.
- 283-84 *Practicum in Clinical Psychology* (3-3) The Staff
Academic year—as arranged. Supervised practical instruction in agencies doing clinical psychological work. Prerequisite: Psychology 212 and 233. Admission by permission of the Executive Officer of the Department.
- 289-90 *Seminar: Current Research and Theory in Psychology* (3-3)
Academic year—evening. A review and discussion of contemporary research and theory in some advanced and specialized field of psychological study, by leaders in the field. The specific topic and instructor for each semester will be announced in advance of the beginning of the semester.
- 295-96 *Research in Psychology* (arr.) The Staff
Academic year—as arranged; summer 1960—Psychology 295 (arr.). Individual research by student, carried out under supervision of staff member. Ind.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1960—Psychology 299 (3).

COURSE OFFERED IN SPECIAL PROGRAM

In addition to the regular courses announced above the University offers the following course, which is available only to students enrolled in the Engineering Administration program.

- 145 *Principles of Human Relations* (3) Kotapish

RADIOLOGY*

Professor W. W. Stanbro (*Executive Officer*); Assistant Professor W. W. Saunders; Assistant Clinical Professors C. P. Donlan, S. R. Bersack, H. J. Kicherer, H. L. Berman, J. A. Isherwood, E. R. King; Associates A. C. Wyman, Herman Litwer, S. W. Smith; Clinical Instructors Nan Van Wagenen, George Tievsky, U. V. Wilcox, C. M. Weber

115-16 *Anatomy*

Academic year—as arranged.

The Staff

220 *Principles of Radiology*

Spring—1 hour a week.

Correlation of gross and Roentgen anatomy.

The Staff

313 *Advanced Radiological Diagnosis*

Fall—as arranged.

Lectures and discussions.

The Staff

421-22 *Clinical Studies*

Students are assigned to the X-ray Department in rotation on a full-time basis for a specific period.

The Staff

RELIGION*

Professor J. R. Sizoo; Associate Professor C. E. Olmstead (*Executive Officer*); Assistant Professor R. G. Jones; Lecturers C. D. Kean, A. B. Seidman

Bachelor of Arts with a major in Religion (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69, including Religion 9, 10, and 59-60. Required: the general requirements as stated on pages 81-87, including a minimum of eighteen semester hours in religion beyond first-group courses.

Master of Arts in the field of Religion (Columbian College).—Prerequisite: an undergraduate major in Religion at this University or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91. Of the twenty-four semester hours of required courses (exclusive of the thesis), at least twelve must be in third-group religion courses; a maximum of nine may be in a closely related field outside the Department of Religion as approved by the Department.

Master of Arts in the field of Religious Education (Columbian College).—Prerequisite: an undergraduate major in Religion at this University or the equivalent; the following specific courses or the equivalent: Education 109-10; Psychology 1, 22, and 29; Sociology and Anthropology 1; Speech 1 or 11.

Required: the general requirements of Columbian College as stated on pages 88-91. Of the twenty-four semester hours of required courses (exclusive of the thesis), at least six must be in third-group religion courses; a maximum of twelve may be in a closely related field outside the Department of Religion as approved by the Department.

Doctor of Philosophy in the field of the History of Religion in the United States (Graduate Council).—See History, page 96.

* The Staff of Instruction here listed is for the academic year 1959-60.

FIRST GROUP

- 9 *The Old Testament* (3) Sizoo, Jones
Fall—morning and evening; summer 1960. A historical and literary approach to the study of the books of the Old Testament with special consideration given to the development of religious ideas, institutions, and outstanding personalities.
- 10 *The New Testament* (3) Sizoo, Jones
Spring—morning and evening. A study of the literature of the New Testament from the standpoint of occasion, purpose, dominant ideas, and permanent values. Special emphasis on the approach, the structure, and the significance of the Gospels and Epistles.
- 59-60 *History of Religion* (3-3) Olmstead
Academic year—morning and evening; summer 1960. *First half:* primitive and ancient national religions; Confucianism, Taoism, Buddhism, Hinduism, and Shintoism—their historical setting, founders, and development of religious thought and culture. *Second half:* Judaism, Christianity, and Islam—analysis of their origin, evolution, and contemporary status.

SECOND GROUP

- 103 *The Prophets, Their Times and Their Message* (3) Jones
Fall—morning. The development of prophetism in the Old Testament; cultural, economic, psychological, and religious factors in the movement; elements of lasting value in the prophetic teaching. A few of the prophets will be selected for particular study.
- 104 *The Life and Thought of Jesus* (3) Jones
Spring—morning. A comprehensive study of the life and teachings of Jesus as they relate to problems of belief, standards of value, and patterns of life; the significance of the message of Jesus for our own times.
- 105 *The Life and Thought of Paul* (3) Kean
Fall—evening. Greek and Hebrew backgrounds of early Christianity, the Roman world of the first century, religious and social conditions affecting the spread of Christianity, the life and journeys of Paul, Paul's teaching and presentation of the Christian faith, the place of the Pauline epistles in the New Testament.
- 121 *Problems of Western Religious Thought* (3) Olmstead
Fall—morning. The nature of religious truth and experience; the existence, character, and activity of God; the predicament of modern man; the problem of evil and suffering; eternal life; science and religion; the meaning of worship; religious views of history.
- 122 *Christian Ethics and Modern Society* (3) Jones
Spring—morning; summer 1960. The nature and principles of the Christian life as developed by the Christian community; problems of personal conduct; the application of the Christian standard to family, social, and economic institutions.
- 131 *History of Christianity to the Reformation* (3) Olmstead
Not offered 1960-61. The rise and expansion of Christianity, the develop-

ment of Christian thought, the evolution of church organization and worship, the Renaissance and pre-Reformation dissent.

- 132 *History of Modern Christianity* (3) Olmstead
Not offered 1960-61. The origin and development of Protestantism; the Roman Catholic revival; the status of the Eastern churches; doctrines, worship, expansion, church and state, and relation to modern thought and life.

- 135 *History of Judaism to the Talmud* (3) Jones
Fall-morning. A study of the history and religious thought of the Jewish people from the Maccabean revolt to the compilation of the Talmud.

- 136 *History of Medieval and Modern Judaism* (3) Seidman
Spring-morning. A study of the history and religious thought of the Jewish people from the compilation of the Talmud to the present.

- 141-42 *Religious Education* (3-3) Jones
Not offered 1960-61. Principles and practices of religious education in the home, church, and community; basic educational procedures and special techniques; organization and administration of religious education.

- 172 *Religion in American Culture* (3) Olmstead
Spring-evening. Growth of religious bodies and institutions in American culture, the heritage of religious freedom and diversity, religion and literature, revivalism and education, science and religious thought, divisions and cooperative movements in religion.

THIRD GROUP

- 209-10 *Seminar in Biblical Literature* (3-3) Jones
Academic year—as arranged. Study of the main problems of Biblical literary and historical criticism.

- 211-12 *Seminar in Biblical Thought* (3-3) Jones
Not offered 1960-61. Study of the Biblical interpretation of history and reality and its relation to Biblical beliefs about God, man, and the world.

- 231-32 *Seminar in the History of Christian Thought* (3-3) Olmstead
(3-3)
Academic year—evening. An advanced study of the development of Christian thought from primitive beginnings to the present.

- 241-42 *Seminar in Religious Education* (3-3)
Not offered 1960-61. Advanced course dealing with some of the major problems in the practice of religious education.

- 271 *Seminar in American Religious History* (3) Olmstead
Not offered 1960-61. Analysis of the main currents in American religious thought.

- 291-92 *Readings and Research* (3-3) The Staff
Academic year—as arranged; summer 1960—Religion 291 (3). Investigation of special problems in the history of religion.

- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged.

ROMANCE LANGUAGES AND LITERATURES*

Professors M. I. Protzman, A. T. Deibert (*Emeritus*), Antonio Alonso (*Emeritus*), G. E. McSpadden (*Executive Officer*); Associate Professors Rafael Supervía, J. W. Robb, W. G. Clubb, C. Y. Meade, G. E. Mazzeo; Assistant Professors J. L. Metivier, Jr., Carlos Lozano

Courses are generally conducted in the language concerned. For Comparative Courses in Romance Languages and Literatures (French, Italian, Spanish) see pages 370-71.

Bachelor of Arts with majors in (1) *French Language and Literature*, (2) *Spanish American Literature*, and (3) *Spanish Language and Literature* (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College.

Required: the general requirements of Columbian College as stated on pages 81-87 and the grade "pass" on the major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined includes the political, social, and cultural backgrounds of the literature studied; the writers and their works. Proficiency in the spoken and written language is required. Majors in Romance Languages are strongly advised to study Latin, a knowledge of which is required for graduate work in most institutions. The Department of Romance Languages provides a proseminar in each of the major fields intended to assist the student in his preparation for the major examination.

Master of Arts in the fields of (1) *French Language and Literature*, (2) *Spanish American Literature*, and (3) *Spanish Language and Literature* (Columbian College).—Prerequisite: the degree of Bachelor of Arts in the appropriate field from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91. The thirty hours of required work must include a thesis, for which six hours of credit are allotted. The remainder of the program is arranged in consultation with the student's major adviser.

Doctor of Philosophy (Graduate Council).—See page 96.

Bachelor of Arts in Education with teaching fields in French and in Spanish (School of Education).—Prerequisite: the Education curriculum, page 72.

Required: the French option, page 162, or the Spanish option, page 165; the professional courses listed on pages 166-67.

FRENCH

FIRST GROUP

1-2 *First-year French* (3-3)

A year course: credit is not given for the first half until the second half is completed. *First half*: fall—morning and evening; spring—morning and evening; summer 1960. *Second half*: fall—morning and evening; spring—morning and evening; summer 1960. For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester.

3-4 *Second-year French*† (3-3)

A year course: credit is not given for the first half until the second half is completed. *First half*: fall—morning and evening; spring—morning and evening;

* The Staff of Instruction here listed is for the academic year 1959-60.
† French 3-4 is required, and French 51-52 is recommended, as prerequisite to all second-group courses.

summer 1960. *Second half:* fall—morning; spring—morning and evening; summer 1960. Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester. Prerequisite: French 1-2 or two years of high school French.

9-10 *French Conversation and Composition* (3-3) The Staff
Academic year—morning and evening; summer 1960. Prerequisite: French 4 or the equivalent and permission of the instructor. Workshop fee, \$4 a semester.

49 *French Readings for Nonmajor Students* (3) Meade and Staff
Fall—evening; spring—evening; summer 1960. Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students.

51-52 *Survey of French Literature and Civilization** Metivier
(3-3)
Academic year—evening. The social, artistic, and cultural background of French civilization. Lectures, readings, recitations, and informal discussions.

SECOND GROUP*

109-10 *Advanced French Conversation and Composition* (3-3) Meade
Academic year—morning. Normally diction will receive greater emphasis in the fall semester and style in the spring semester. Prerequisite: French 10 or the equivalent and permission of the instructor.

119-20 *French Literature of the Sixteenth Century* (3-3)
1961-62 and alternate years. Prose, poetry, drama, and memoirs of the French Renaissance; Rabelais, Montaigne, Marot, La Pléiade, etc. Class analysis of texts, collateral reading. Recommended: History 120.

121-22 *French Literature of the Seventeenth Century* Protzman
(3-3)
1960-61 and alternate years: academic year—morning. History, philosophy, criticism, memoirs, letters, eloquence, drama, fiction, poetry. Class analysis of texts; collateral reading.

123-24 *French Literature of the Eighteenth Century* (3-3)
1961-62 and alternate years. History, philosophy, criticism, letters, drama, fiction, poetry, the "salons", the idea of progress, the idea of science. Class analysis of texts, collateral reading, lectures on literature and history.

125-26 *French Literature of the Nineteenth Century* (3-3) Frey†
1960-61 and alternate years: academic year—evening. Romanticism and realism: fiction, poetry, drama, criticism. Class analysis of texts, collateral reading, lectures on literature and history.

127-28 *French Literature of the Twentieth Century* (3-3) Clubb
1961-62 and alternate years. Fiction, poetry, drama, criticism. Class analysis of texts, collateral reading, lectures on literature and history.

* French 3-4 is required, and French 51-52 is recommended, as prerequisite to all second-group courses.
† Appointment effective September 1960.

- 129 *Contemporary French Literature* (3) Clubb
 Summer 1960. Existentialism in the novel and drama from 1938 to the present. Lectures, discussions, and reports.
- 199-200 *Proseminar: Readings for the Major in French Literature* (3-3) Clubb
 Academic year—as arranged. Conferences and group discussions.

THIRD GROUP

- 201 *Doctoral Seminar I** (3) The Staff
 Fall—afternoon. Introduction to the doctoral program. Advanced study and methodology in the Romance languages and literatures.
- 203 *Explication de textes** (3)
 Not offered 1960-61. An introduction to the analytical study of French literature. The method will be demonstrated and practiced with selected passages.
- 205-6 *Problems of Teaching French Language and Literature in College* (3) The Staff
 Academic year—afternoon. For candidates for the degree of Doctor of Philosophy. Principles and problems of learning and teaching the language and literature. Apprenticeship in college classes and the language laboratory.
- 224 *La Crise de la conscience européenne (1680-1749)** (3) Meade
 Not offered 1960-61. Bayle, Fontenelle, Montesquieu, Voltaire, Diderot, and the Encyclopedists as philosophers, dramatists, novelists, and critics of their age; an assessment of their contributions to the intellectual evolution of France and Europe.
- 225 *Seminar: Realism and Naturalism* (3) Meade
 Fall—afternoon. Special studies in poetry, the novel, and the drama.
- 226 *Seminar: the Social Novel of the Twentieth Century* (3) Meade
 Spring—afternoon. Studies in the works of Malraux, Saint-Exupéry, Montherlant, Céline, and others.
- 227-28 *Seminar: Modern French Literature* (3-3)
 1962-63 and every third year. Prerequisite: a second-group course in French literature.
- 229-30 *Seminar: Classical French Literature* (3-3)
 1962-63 and every third year. Prerequisite: a second-group course in French literature.
- 235 *Seminar: the Renaissance in Europe* (3) Clubb
 Fall—afternoon. The sources and nature of literary trends from Dante to Calderon, and their relationship to French literature.
- 239 *Introduction to Romance Philology and Linguistics* (3)
 See Comparative Courses in the Romance Languages and Literatures.

* This course was first given in the academic year 1959-60.

- 240 *Historical French Grammar** (3)
1962-63 and every third year. Study of phonology, morphology, and syntax of Old French, including its development from Vulgar Latin. Practical exercises based on texts. Prerequisite: a second-group course in French literature, Romance 239 *Introduction to Romance Philology and Linguistics* (see Comparative Courses), and an elementary knowledge of Latin.

- 249 *Old French* (3)
Not offered 1960-61. Survey of French literature to the end of the 13th century. Prerequisite: a second-group course in French literature, Romance 239 *Introduction to Romance Philology and Linguistics* (see Comparative Courses), and an elementary knowledge of Latin.

- 251-52 *Middle French* (3-3)
A year course: credit is not given for the first half until the second half is completed. Not offered 1960-61. French literature of the 14th and 15th centuries. Class analysis of texts, collateral reading. Prerequisite: a second-group course in French literature. Knowledge of Old French is desirable.

- 299-300 *Thesis* (3-3)
Academic year—as arranged.

The Staff

PORTUGUESE

FIRST GROUP

- 1-2 *First-year Portuguese* (3-3)
A year course: credit is not given for the first half until the second half is completed. Not offered 1960-61. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Portuguese prose. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester.

- 3-4 *Second-year Portuguese* (3-3)
A year course: credit is not given for the first half until the second half is completed. Not offered 1960-61. Conversation, grammar, composition, reading of modern Portuguese prose, oral practice, introduction to Portuguese and Brazilian civilization. Prerequisite: Portuguese 1-2 or the equivalent.

SECOND GROUP

- 127-28 *Portuguese and Brazilian Literature* (3-3)
Not offered 1960-61. Evolution of the Portuguese language; outline of the literature of Portugal (fall semester) and Brazil (spring semester). Lectures, readings, written reports. Conducted in Portuguese. Prerequisite: Portuguese 3-4 or the equivalent.

SPANISH

FIRST GROUP

- 1-2 *First-year Spanish* (3-3)
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—morning and evening; summer 1960. *Second half:* fall—morning and evening; spring—morning and evening; summer 1960. For beginners. Pronunciation, conversation, gram-

The Staff

* This course was first given in the academic year 1959-60.

mar, composition, reading of modern Spanish prose. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester.

3-4 *Second-year Spanish** (3-3)

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—morning and evening; summer 1960. *Second half:* fall—morning; spring—morning and evening; summer 1960. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester. Prerequisite: Spanish 1-2 or two years of high school Spanish.

9-10 *Spanish Conversation and Composition* (3-3)

Academic year—morning and evening; summer 1960. Prerequisite: Spanish 4 or the equivalent and permission of the instructor. Workshop fee, \$4 a semester.

49 *Spanish Readings for Nonmajor Students* (3)

Fall—evening; spring—evening. Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students.

51-52 *Survey of Spanish Literature and Civilization** (3-3)

Academic year—morning. The social, artistic, and cultural background of Spanish civilization. Lectures, readings, recitations, and informal discussion.

SECOND GROUP*

109-10 *Advanced Spanish Conversation and Composition* (3-3)

Academic year—morning. Normally diction will receive greater emphasis in the fall semester and style in the spring semester. Prerequisite: Spanish 10 or the equivalent and permission of the instructor.

121-22 *Spanish Literature of the Golden Age* (3-3)

1961-62 and alternate years. Lope de Vega, Calderón; the classic drama, the ballad, lyric poetry. Class analysis of texts, collateral reading, lectures on literature and history.

123-24 *Cervantes: Don Quijote* (3-3)

1960-61 and alternate years: academic year—morning. Reading of the *Quijote* and other works of the author. Lectures, discussions, and reports.

125-26 *Modern Spanish Literature* (3-3)

1960-61 and alternate years: academic year—morning. Prose and poetry of the 18th and 19th centuries. Class analysis of texts, collateral readings, lectures on literature and history.

127-28 *Contemporary Spanish Literature* (3-3)

1961-62 and alternate years. Prose and poetry of the 20th century. Class analysis of texts, collateral reading, lectures on literature and history.

* Spanish 3-4 is required, and Spanish 51-52 is recommended, as prerequisite to all second-group courses in Spanish.

- 151-52 *The Spanish American Novel* (3-3) Robb
1962-63 and every third year. Development of the novel in Spanish America. Lectures, collateral reading, and class analysis of texts.
- 155-56 *Spanish American Literature to 1880* (3-3) Robb
1960-61 and every third year: academic year—evening. The literature of Spanish America from the colonial period to the latter part of the 19th century. Lectures, collateral reading, reports, and class analysis of important works.
- 157-58 *Spanish American Literature since 1880* (3-3) McSpadden, Robb
1961-62 and every third year. The literature of Spanish America from 1880 to the contemporary period. Lectures, collateral reading, reports, and class analysis of important works.
- 197-98 *Proseminar: Readings for the Major in Spanish American Literature* (3-3) Robb
Academic year—as arranged. Conferences and group discussions.
- 199-200 *Proseminar: Readings for the Major in Spanish Literature* (3-3) Lozano
Academic year—as arranged. Conferences and group discussions.

THIRD GROUP

- 201 *Doctoral Seminar I** (3) The Staff
Fall—afternoon. Introduction to the doctoral program, advanced study and methodology in the Romance languages and literatures.
- 203 *Explicación de textos** (3)
Not offered 1960-61. An analytical introduction to the study of Spanish and Spanish-American literature. The method will be demonstrated and practiced on selected passages.
- 205-6 *Problems of Teaching Spanish Language and Literature in College* (3) The Staff
Academic year—afternoon. For candidates for the degree of Doctor of Philosophy. Principles and problems of learning and teaching the language and literature. Apprenticeship in college classes and the language laboratory.
- 221 *Seminar: Works of Cervantes* (3) McSpadden
Fall—afternoon. Problems of composition, interpretation, criticism, literary history, and aesthetics.
- 223 *Seminar: Spanish Writers of the Eighteenth Century** (3) Mazzeo
Not offered 1960-61.
- 225 *Seminar: Works of Unamuno and Ortega y Gasset* (3) Supervía
Not offered 1960-61.
- 227-28 *Seminar: Spanish-American Literature* (3-3) Robb
Not offered 1960-61.

* This course was first given in the academic year 1959-60.

- 229 *Seminar: Spanish Romanticism* (3) Mazzeo
Fall—afternoon. Problems of origins and development.
- 234 *Seminar: Works of Galdós* (3) Supervia
Spring—afternoon. Ideological and stylistic analysis; relationship of his works to the literary movements of the second half of the 19th century.
- 239 *Introduction to Romance Philology and Linguistics* (3)
See Comparative Courses in Romance Languages and Literatures.
- 240 *Historical Spanish Grammar** (3) McSpadden
Not offered 1960-61. Study of phonology, morphology, syntax, and lexicology of Old Spanish, including its development from Vulgar Latin. Practical exercises based on texts. Prerequisite: a second-group course in French literature, Romance 239 *Introduction to Romance Philology and Linguistics* (see Comparative Courses), and an elementary knowledge of Latin.
- 243 *Problems of Pronunciation and Intonation* (3) McSpadden
(Formerly Spanish 226)
Not offered 1960-61.
- 249 *Old Spanish* (3) McSpadden
Not offered 1960-61. Literature and language: *El poema de Mio Cid*, *El Conde Lucanor*, *El Libro de Buen Amor*, etc. Prerequisite: a second-group course in Spanish literature, Romance 239 *Introduction to Romance Philology and Linguistics* (see Comparative Courses), and an elementary knowledge of Latin.
- 258 *Seminar: Contemporary Spanish-American Poetry* Lozano
(3)
Spring—afternoon. Studies of aesthetic principles and poetic movements. Emphasis on Huidobro, Neruda, and others.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged.

COMPARATIVE COURSES IN THE ROMANCE LANGUAGES AND LITERATURES

In addition to the preceding courses in the particular Romance languages and literatures, the following which are especially concerned with comparative aspects of Romance studies are offered.

- 212 *Comparative Romance Languages and Literatures I (Italian)* (3) (Replaces Italian 201 *Comparative Italian Language and Literature* (3)*) Lozano
Not offered 1960-61. Intensive study of Italian grammar with reference to French, Spanish, and other Romance languages.
- 213-14 *Comparative Romance Languages and Literatures II, III (Italian)* (3-3) (Replaces Italian 201 *Comparative Italian Language and Literature* (3)*) Clubb
Academic year—afternoon. For candidates for the degree of Doctor of Philosophy. The Italian language and literature from Dante to Goldoni. Lec.

* This course was first given in the academic year 1959-60.

tures, discussions, exercises, and readings. Prerequisite: Romance 212 *Comparative Romance Languages and Literatures I* or the equivalent.

239 *Introduction to Romance Philology and Linguistics** (3) McSpadden

1962-63 and every third year: fall—evening. Study of principles found in the development of the Romance languages and methods of analysis at the present time. A general course for graduate students in the fields of the Romance languages and literatures. Prerequisite: an elementary knowledge of Latin. This course normally followed by French 240 or Spanish 240.

260 *Introduction to Romance Stylistics* (3) Frey†

Spring—afternoon. Special emphasis will be placed on examples from French and Spanish literature.

SECRETARIAL STUDIES‡

Associate Professor M. H. Shott (*Executive Officer*); Associates W. H. Westbrook, Amil Jackowski, M. M. Weid

Associate in Arts (Junior College—two-year vocational curriculum in Secretarial Studies).—For curriculum, see page 76.
Bachelor of Arts in Education with a teaching field in Business Education (School of Education).—Prerequisite: the Education curriculum, page 72.
 Required: the Business Education option, pages 160-61 and the professional courses listed on pages 166-67.

FIRST GROUP

1 *Elementary Typewriting* (3) Shott and Staff

Fall—evening; spring—evening. Fundamental techniques of typewriting, basic styles of business letters, introduction to tabulation, and preparation of general office forms. Laboratory fee, \$7.

2 *Intermediate Typewriting* (3) Shott and Staff

Fall—evening; spring—afternoon and evening. The business letter and its arrangement, advanced tabulation, manuscript typing, office forms, stencil cutting, and legal documents. Prerequisite: Secretarial Studies 1 or the equivalent; ability to type accurately at 30 words a minute. Laboratory fee, \$7.

11 *Elementary Shorthand and Transcription* (3) Shott and Staff

Fall—morning and evening; spring—evening; summer 1960. A study of the principles of Gregg shorthand correlated with dictation and transcription. Minimum dictation speed of 60 words a minute attained. Laboratory fee, \$3.

12 *Intermediate Shorthand and Transcription* (3) Shott and Staff

Fall—evening; spring—morning and evening. Review of the principles of Gregg shorthand. Dictation and transcription on general and specialized business subjects. Minimum dictation speed of 80 words a minute attained. Prerequisite: Secretarial Studies 11.

* This course was first given in the academic year 1959-60.
 † Appointment effective September 1960.
 ‡ The Staff of Instruction here listed is for the academic year 1959-60.

requisite: Secretarial Studies 11 or the equivalent; ability to take dictation at 60 words a minute. Laboratory fee, \$5.

- 15 *Advanced Shorthand, Typewriting, and Transcription* (3) Shott
Fall—morning; summer 1960. Dictation and transcription involving vocabularies in specific businesses. Minimum speed of 100 words a minute attained in dictation. Prerequisite: Secretarial Studies 12 or the equivalent. Laboratory fee, \$5.
- 16 *Secretarial Shorthand, Typewriting, and Transcription* (3) Shott
Spring—morning. Dictation and transcription involving vocabularies used in the legal and medical professions. Minimum dictation speed of 120 words a minute attained. Prerequisite: Secretarial Studies 15 or the equivalent. Laboratory fee, \$5.
- 51 *Business Correspondence* (3) Shott
1960-61 and alternate years: fall—morning; 1961-62 and alternate years: fall—evening. Development of the technique of effective communication with reference to business letters and forms. Survey and analysis of current business literature.
- 54 *Secretarial Practice* (3) Shott
Spring—morning. A thorough study of secretarial problems and procedures. Practice in the use of secretarial equipment and supplies. The study of secretarial personality and office relationships.

SLAVIC LANGUAGES AND LITERATURES*

Associate Professor H. B. Yakobson (*Executive Officer*); Assistant Professor E. E. Pantzer III; Lecturers Vladimir Tolstoy, E. S. Serebrennikov, Natalie Clarkson, Kiril Jaszenko, Julia Petrov

Bachelor of Arts with a major in Russian (Columbian College—Departmental).
—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69.
Required: in addition to the general requirements of Columbian College as stated on pages 81-87, eighteen semester hours in Slavic Languages and Literatures and in History, to be selected from Slavic Languages and Literatures 91-92, 141-42, 151-52, and History 143-44, 145-46; and either Slavic Languages and Literatures 101-2 or 103-4. (The requirement of a second-group Russian language course may be met by satisfactory passing of an examination. The six hours thus waived will be made up by electing from the literature and history courses.)

FIRST GROUP

1-2 *First-year Russian* (3-3)

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—evening; summer 1960. *Second half:* fall—evening; spring—morning and evening; summer 1960. A beginner's course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice in electronic language workshop. Workshop fee, \$6 a semester.

* The Staff of Instruction here listed is for the academic year 1959-60.

3-4 *Second-year Russian* (3-3)

Yakobson and Staff

A year course; credit is not given for the first half until the second half is completed. *First half*: fall—morning and evening; spring—evening. *Second half*: fall—evening; spring—morning and evening. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics. Workshop fee, \$6 a semester.

9-10 *Russian Conversation* (3-3)

Yakobson and Staff

Academic year—evening. Listening comprehension and oral practice in electronic language workshop. Workshop fee, \$6 a semester.

91-92 *Introduction to Slavic Literature* (3-3)

Pantzer

Academic year—morning. Lecture, recitation, and discussion. *First half*: a survey of Slavic literature in translation from early written and oral forms to the literary masterpieces of the 19th and 20th centuries. *Second half*: a survey of Russian literature.

SECOND GROUP

101-2 *Rapid Readings in Russian* (3-3)

Pantzer

Academic year—evening. Representative Russian readings in the social sciences and periodical literature.

103-4 *Scientific Russian* (3-3)

Yakobson

1960-61 and alternate years: academic year—evening. Reading and translation of technical texts.

141-42 *Russian Literature of the 19th Century* (3-3)

Pantzer

1960-61 and alternate years: academic year—evening. Lectures, special reports, class analysis of selected works of the 19th century Russian literature—in Russian. Prerequisite: Russian 1-2; 3-4.

151-52 *Russian Literature of the 20th Century* (3-3)

Pantzer

1961-62 and alternate years. Lectures, special reports, class analysis of selected works of 20th century Russian literature—in Russian. Prerequisite: Russian 1-2; 3-4.

SOCIOLOGY AND ANTHROPOLOGY*

Professor H. L. Geisert (*Executive Officer*); Associate Professors C. B. Lavell, R. W. Stephens; Assistant Professor J. M. Campbell

Bachelor of Arts with a major in Sociology and Anthropology (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69, including six hours in first-group courses in Sociology and Anthropology.

Required: in addition to the general requirements of Columbian College as stated on pages 81-87, twenty-four semester hours on Sociology and Anthropology, which must include 172 and 181 and six hours selected from Sociology and Anthropology 115, 116, 142, 152, 153, 155.

Master of Arts in the field of Sociology and Anthropology (Columbian College).

* The Staff of Instruction here listed is for the academic year 1959-60.

—Prerequisite: the degree of Bachelor of Arts with a major in Sociology and Anthropology in this University, or the equivalent.

Required: the requirements of Columbian College, as stated on pages 88-91. The thirty hours of required work must include a minimum of eighteen hours in third-group courses.

FIRST GROUP

I-2 *Man in Modern Society** (3-3)

First half: fall—morning and evening; spring—morning; summer 1960. *Second half:* fall—morning; spring—morning and evening. Development of culture and personality, the impact of groups and institutions on man's social behavior. Factors producing social problems; individual, community, national and international disorganization. The Staff

51 *Introduction to Anthropology** (3)

Fall—morning and evening; spring—morning and evening. Development of fossil and living man, races of mankind, the origin and growth of civilization; the structure and development of human relationships. Campbell

SECOND GROUP

115 *Cultural Anthropology* (3)

1961-62 and alternate years. Development of social life and customs in preliterate societies, universals, and aspects of culture, theories relating to culture, society, and personality.

116 *Comparative Anthropology of North America* (3)

1961-62 and alternate years. Origin and nature of native cultures; the use of concepts of culture areas and age areas, traditions and co-traditions in the study of culture similarities, differences, and the dissemination of culture traits.

123 *Fields of Social Work* (3)

1961-62 and alternate years. Introduction to the nature and scope of social work; the development of social work programs; functions of social case work, social group work, and social action.

126 *Urban Sociology* (3)

Spring—morning. The place of the city in the larger society: growth of the city, problems of urban living, group life, personality, urban housing, and city planning. Includes consideration of suburban development. Geisert

127 *Community Organization* (3)

1961-62 and alternate years. Principles common to communities throughout the world: social interaction and social disorganization, population growth and community structure, spatial organization, community change. Lavell

131 *Social Institutions* (3)

Fall—morning. Functional analysis of basic social institutions: family, education, religion, and state in the structure of American society. Lavell

132 *Courtship and Marriage* (3)

Spring—morning. Dating and courtship as social processes, reasons for marriage, marriage laws, mate selection, factors in marital adjustment; prediction and counseling.

* Sociology and Anthropology 1 or 51 is prerequisite to all other courses in Sociology and Anthropology.

- 133 *The Family in Modern Society* (3)
1961-62 and alternate years. Historical development of the family as a social institution, parent-child relations, family problems, disorganization and divorce, and family reorganization.
- 134 *Sociology of Child Development* (3)
1961-62 and alternate years. Socialization of the child through the home and other social institutions, the changing status of childhood, dependent and handicapped children.
- 135 *Juvenile Delinquency* (3)
1961-62 and alternate years. Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders.
- 136 *Criminology* (3)
1961-62 and alternate years. Nature and distribution of crime, police and court systems, prisons and reformatories, treatment and prevention of crime.
- 141 *Population Problems* (3) Geisert
Fall—morning. Composition of populations, trends in population growth and population pressure, factors producing population movements, effects of migration, population policies.
- 142 *Race and Cultural Contacts* (3) Campbell
Spring—morning. The origins of races and an examination of the influence of culture on racial composition. Includes the relationship of race to religious, national, and ethnic groups.
- 151 *Human Relations in Industry* (3)
1961-62 and alternate years; summer 1960. Sociological analysis of work situations, occupational mobility, development of the labor movement, industrial leadership and morale.
- 152 *Dynamics of Culture* (3) Campbell
Spring—morning; summer 1960. Factors and processes making for stability and change in culture; "the nature of cultural growth, invention, diffusion, and acculturation"; and the disintegration and reintegration of cultures.
- 153 *Culture and Personality* (3) Campbell
Fall—morning. Influences of group membership and cultural conditions on personality; socio-cultural factors in mental health; and the relationship of personality to caste, class, and occupation.
- 154 *Language and Culture* (3)
Not offered 1960-61. The nature and significance of human communication, the distribution and dynamics of languages, linguistic changes, the role of language in culture.
- 155 *Applied Anthropology* (3) Campbell
Fall—morning. The application of anthropological methods and techniques in the modern world. The use of applied anthropology in specific fields, including government, business, law, and medicine.
- 161 *Social Stratification: Class and Status* (3) Lavell
Fall—morning. Nature of class structure patterns of status, prestige relations in American society, differential class behavior, and analysis of comparative social structure.

162 *Social Movements* (3)

Lavell

Spring—evening. Major contemporary movements examined as aspects of social change and collective behavior. Designed to disclose competing ideologies and to show the way in which social movements develop.

164 *Social Control* (3)

1961-62 and alternate years. Informal and formal phases of human control, analysis of methods of control used in modern society and the situations in which they occur, policies and techniques of control.

172 *Contemporary Social Theory* (3)

Stephens

Spring—evening. Systematic study of the important schools of contemporary sociology, including recent European as well as American developments; an evaluation of the scientific contribution of each school.

181 *Methods of Social Research* (3)

Stephens

Fall—evening. Analysis of social research techniques and the scientific method; application to social data of the case study, social survey, statistical, sociometric, and experimental methods.

THIRD GROUP

221 *Seminar: Current Trends in Sociology* (3)

Geisert

Fall—evening. Analysis and evaluation of recent developments in sociology, and an appraisal of the role of systematic theory in sociology.

222 *Seminar: Anthropological Theory* (3)

Geisert

Spring—evening. Analysis of the theoretical postulates and assumptions underlying the development of modern cultural and social anthropology.

227 *Seminar: Small Groups* (3)

1961-62 and alternate years. General characteristics of small groups and their measurement, sociography of groups, evaluation of small group theory and sociometry, other techniques of group research.

228 *Seminar: Mass Communications* (3)

1961-62 and alternate years. The communication process; barriers to communication; structure and function of communication in society; content, control, support, and effects of mass communication.

295-96 *Research* (arr.)

The Staff

Academic year—as arranged; summer 1960.

299-300 *Thesis* (3-3)

The Staff

Academic year—as arranged; summer 1960.

SPEECH*

Professors L. P. Leggette (*Executive Officer*), C. W. Pettit (*Director of Speech Clinic*); Associate Professors G. F. Henigan, Jr., E. L. Stevens, L. S. Bielski; Lecturers E. S. Surrey, A. A. Nilles, S. L. Berlinsky, Dorothy Vaill, R. M. Wenley, A. L. Rotolo

* The Staff of Instruction here listed is for the academic year 1959-60.

Bachelor of Arts with a major in Speech (Columbian College—Departmental).
 —Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69, including Speech 1, 2, 11, 32.

Required: the general requirements of Columbian College as stated on pages 81-87, including the passing of a speech proficiency test early in the program, Speech 101, 121, 154, 175, and a minimum of twelve additional hours in second-group courses in the speech arts or speech science, as approved by the adviser.

Bachelor of Arts with a major in Dramatic Art (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see page 69, including twelve hours in the basic courses in speech and six hours in English 51-52, 71-72, or 91-92.

Required: the general requirements of Columbian College as stated on pages 81-87, including the passing of a speech proficiency test early in the program. Speech 101-2, a minimum of nine additional hours in theater arts in the Speech Department and nine hours in dramatic literature in the English Department, as approved by the adviser.

Master of Arts in the field of Speech Correction (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Speech from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91.

Bachelor of Arts in Education with a teaching field in Speech (School of Education).—Prerequisite: the Education curriculum, page 72.

Required: the Speech option, pages 165-66, and the professional courses listed on pages 166-67.

FIRST GROUP

A *Speech Clinic*

Fall—as arranged; spring—as arranged; summer 1960. Individual or group lessons, without academic credit, for such speech difficulties as lisping, cleft palate, articulatory problems, and stuttering. Fee: for individual lesson, \$7; for group lesson, \$4.

Pettit and Staff

B *Spoken English (3)*

Fall—evening; spring—evening; summer 1960. Class limited to foreign-born students. Instruction in the formation of the sounds of spoken English, with emphasis on rhythm and inflection. The International Phonetic Alphabet is used. Recording fee, \$5.

Bielski, Vaill

1 *Effective Speaking (3)*

Fall—morning, afternoon, and evening; spring—morning, afternoon, and evening; summer 1960. Preparation and delivery of extemporé speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, \$2.

Leggette and Staff

2 *Persuasive Speaking (3)*

Fall—morning; spring—morning and evening. A continuation of Speech 1, which is prerequisite, with emphasis on speech composition and elementary principles of persuasion.

Henigan and Staff

11 *Voice and Diction (3)*

Fall—morning and evening; spring—morning and evening; summer 1960. Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of the sounds of English, the standards of speech. Class instruction in the problems of rate, volume, pitch, and quality. Recording fee, \$4.

The Staff

- 32 *Oral Reading* (3) Leggette and Staff
Fall—afternoon; spring—morning and evening; summer 1960. Reading to others, theory and practice in the problems of interpreting the printed page. Prerequisite: Speech 11 or the permission of the instructor. Recording fee, \$2.

SECOND GROUP

- 101 *Voice and Phonetics* (3) Bielski
Fall—afternoon. The International Phonetic Alphabet and its applications to the student's own speech improvement; also personal application to such fields as theater, public speaking, speech correction, radio, television, and foreign languages. Recording fee, \$4.
- 102 *Oral Interpretation of Literature* (3) Leggette
Spring—afternoon. Theory and practice in the problems of communicating meaning and emotion. Selections for study include poetry and prose. Prerequisite: Speech 32 or permission of the instructor. Recording fee, \$2.
- 121 *Group Discussion and Conference Leadership* (3) Stevens
Fall—morning; spring—evening; summer 1960. The process of thinking and problem solving in committees and small groups, and the methods of leading discussions and conferences. Prerequisite: 6 hours of speech or the permission of the instructor.
- 126 *Public Discussion and Debate* (3) Henigan
Spring—afternoon. Principles and types of public discussion and debate; practice in argumentative speaking on questions of current interest. Prerequisite: 6 hours of speech or the permission of the instructor.
- 133-34 *Radio and TV Broadcasting* (3-3) Wenley
Academic year—evening. A study of the development of the radio and TV industries, station organization and management, equipment, production techniques; practice in the preparation and performance of radio programs. Admission by permission of the instructor. Recording fee, \$5 a semester.
- 141 *Speeches for Special Occasions* (3) Henigan
Fall—afternoon. The preparation and presentation of speeches for formal occasions with emphasis on the psychology of the audience. Prerequisite: 6 semester hours of speech.
- 145 *Speech Criticisms* (3) Henigan
Not offered 1960-61. A study of rhetorical theory with application to the criticism of representative American and British oratory. Prerequisite: permission of the instructor.
- 153 *Acting* (3) Leggette
Fall—evening. Study and practice in the fundamentals of acting technique. Prerequisite: permission of the instructor. Laboratory fee, \$5.
- 154 *Play Production* (3) Leggette
Spring—evening. Fundamentals of play production. Under the supervision of the instructor, students prepare one-act plays for presentation. Prerequisite: permission of the instructor. Laboratory fee, \$5.
- 155-56 *Play Production Practice* (1-1) The Staff
Academic year—as arranged. Practical work in theater.

- 166 *History of the Theater* (3) Nilles
Spring—evening. A general survey of the rise of the theater, the Classical, Medieval, Renaissance, later English and Continental, and the Modern theater. Admission by permission of the instructor.

- 169-70 *Creative Dramatics and Children's Theater* (3-3) Burger*
Academic year—evening. A study of creative dramatics and its use as a learning tool, with problems and experience in producing children's plays.

- 175-76 *Speech Correction* (3-3) Pettit
Academic year—afternoon. A study of the causes of the disorders of speech with emphasis on methods in diagnosis and treatment of defective speech. Admission by permission of the instructor.

- 177-78 *Clinical Practice in Speech Therapy* (1-1) The Staff
Academic year—as arranged; summer 1960. Supervised case work in remedial speech—the University Speech Clinic, Children's Hospital, District of Columbia Crippled Children's Society, and Public School system. This course may be repeated for a total of 6 semester hours. Prerequisite: Speech 101, 175, and permission of the instructor.

- 182 *Hearing Problems and the Testing of Hearing* (3) Rotolo
Not offered 1960-61. A study of the field of audiology with emphasis on the testing of hearing. Admission by permission of the instructor.

- 183-84 *Clinical Practice in Hearing Therapy* (1-1) The Staff
Academic year—as arranged; summer 1960. Supervised case work with persons handicapped with hearing losses—the University Speech Clinic, the Washington Hearing Society, and Children's Hospital. This course may be repeated for a total of 3 semester hours. Prerequisite: Speech 182 and permission of the instructor.

- 191 *Proseminar: Speech Correction* (3) Pettit
Fall—evening.

THIRD GROUP

- 279 *Speech Science* (3) Berlinsky
Spring—evening. The anatomy, physiology, physics, and psychology of speech production, with a survey of experimental work. Admission by permission of the instructor.

- 280 *Speech Pathology* (3) Berlinsky
Not offered 1960-61. An advanced study of the causes and symptoms of the major physiogenic and psychogenic disorders. Admission by permission of the instructor.

- 284 *Hearing Rehabilitation* (3)
Spring—evening. Theory and practice in the following aspects of hearing rehabilitation: speech reading, auditory training, and speech conservation. Admission by permission of the instructor.

- 286 *Seminar in Speech Pathology* (3) Pettit
Not offered 1960-61.

* Appointment effective September 1960.

295-96 *Research in Speech and Hearing* (arr.)

The Staff

299-300 *Thesis* (3-3)

The Staff

COURSE OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following course, which is available to personnel in the U. S. Navy and Marine Corps only.

III *Effective Speech Communication* (3)

The tools and principles of effective speech communication, including practice in the organization, delivery, and the evaluation of presentations commonly encountered by professional personnel. Not open to Speech majors.

RELATED COURSES IN OTHER DEPARTMENTS

English 125, *Introduction to English Linguistics*English 135-36, *Shakespeare*English 175-76, *American Drama*English 183-84, *The English Drama*Education 133-34, *Observation and Student Teaching in Secondary Schools*

STATISTICS*

Professors F. M. Weida (*Emeritus*), E. H. Johnson, H. F. Bright (*Executive Officer*); Professorial Lecturers Solomon Kullback, H. L. Stier; Lecturers Samuel Greenhouse, Morton Kupperman; Instructor R. E. Thomas

Bachelor of Arts or Bachelor of Science with a major in Mathematical Statistics (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, see pages 69 and 70. Electives must include Mathematics 12, 29, and 30; Statistics 91.

Required: the general requirements of Columbian College as stated on pages 81-87, including Mathematics 31; Statistics 117, 118, 155, 157-58, and six additional hours of second-group statistics courses selected with the approval of the adviser; a minimum of twenty-four semester hours of courses in other departments approved by the adviser as contributing to a well-organized program; and the grade of "pass" on the major examination at the end of the senior year. For further details, consult the adviser.

Master of Arts or Master of Science in the field of Mathematical Statistics (Columbian College).—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively, with a major in Statistics at this University, or the equivalent.

* The Staff of Instruction here listed is for the academic year 1959-60.

Required: the general requirements of Columbian College as stated on pages 88-91. The required twenty-four semester hours, in addition to a thesis in Statistics, include at least twelve hours to be selected from approved third-group courses in Statistics. The remaining twelve hours must be selected in consultation with the adviser.

Doctor of Philosophy (Graduate Council).—See page 97.

Bachelor of Arts in Government or Master of Arts in Government with a major in Business and Economic Statistics (School of Government).—See pages 179-80, 184, 185-87, 188.

FIRST GROUP*

51 *Introduction to Business and Economic Statistics* (3) The Staff
Lecture (2 hours), laboratory (2 hours). Fall—morning and evening; spring—morning and evening; summer 1960. Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

52 *Mathematics of Finance* (3) The Staff
Lecture (2 hours), laboratory (2 hours). Fall—morning and evening; spring—morning, afternoon, and evening; summer 1960. Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

53 *Introduction to Statistics in Psychology and Education* (3) The Staff
Lecture (2 hours), laboratory (2 hours). Fall: lecture—morning and evening, laboratory—afternoon and evening; spring—morning and evening; summer 1960. Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, frequency distributions, reliability and validity of tests, normal curve, correlation, elementary sampling, and an introduction to estimation and tests of hypotheses. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

91 *Principles of Statistical Methods*† (3) Thomas
Fall: lecture (2 hours), laboratory (2 hours)—evening; spring—morning; summer 1960. Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

SECOND GROUP

105 *Statistics in Psychology and Education* (3) Bright
Spring: lecture (2 hours), laboratory (2 hours)—morning. Advanced study of statistical techniques necessary for an application of statistics in research problems. Analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 53. Laboratory fee, \$9.

* Of first-group courses, Statistics 51, 53, and 91 are related in their subject matter, and credit hours for only one of the three may be applied toward a degree. Statistics 52 lies outside of this group, and may be taken for degree credit in combination with any one of the other three.

† Statistics 91 is for Statistics majors, for students in engineering and in the biological and physical sciences.

106 *Factor Analysis* (3)

Not offered 1960-61. Matrix theory as applied to factor analysis, introduction to the concepts of factor analysis and their utility in various phases of research. Prerequisite: Statistics 53 or the equivalent. Laboratory fee, \$9.

107 *Statistics for Engineers* (3)

Fall—evening; spring—evening; summer 1960. Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus.

109 *Managerial Statistics* (3)

Fall—evening. Role of statistics and the contribution of statistical procedures in various phases of business management with emphasis on the need for and usefulness of the statistical method rather than the mechanics of analysis. Subject matter comprises sources and methods for collecting data, effective forms of presentation, techniques for summarizing and analyzing quantitative and qualitative information, interpretation of and inferences from available data. Admission by permission of the instructor or following Statistics 51.

110 *Quality Control Techniques* (3)

Not offered 1960-61. Applications of probability and distribution theory to industrial control problems; use of quality control charts; acceptance sampling plans; estimation of lot and process characteristics. Prerequisite: Statistics 51 or permission of instructor.

111 *Business and Economic Statistics I* (3)

Fall—morning and evening. Statistical processes as related to particular types of problems encountered in business administration and economic research. Subject matter comprises characteristic values, measures of variability, sampling processes, sampling distributions, and simple correlation. Admission by permission of the instructor.

112 *Business and Economic Statistics II* (3)

Spring—morning and evening. Application of statistical methods to specific problems of business administration and economics. Subject matter comprises multiple and partial correlation, time series analysis, index numbers, business cycles, demand functions, and depreciation schedules. Prerequisite: Statistics 111 or the equivalent.

117 *Analysis of Variance I* (3)

Lecture (2 hours), laboratory (2 hours). Fall—evening; summer 1960. The analysis of variance to segregate factors producing significant variation; a method to estimate experimental error, multiple classifications, Latin Square, Greco-Latin Square, factorials; an introduction to model theory. Prerequisite: Statistics 91. Laboratory fee, \$9.

118 *Correlation and the Chi-square Test I* (3)

Lecture (2 hours), laboratory (2 hours). Spring—evening; summer 1960. Regression and correlation theory: simple, partial, and multiple; nonparametric methods; analysis of covariance; contingency table analysis; tests of goodness of fit. Prerequisite: Statistics 91. Laboratory fee, \$9.

121 *Index Numbers* (3)

Fall—morning. Definition and theory of index numbers, methods of construction, their interpretation, use, and limitations. Prerequisite: Statistics 51 or the equivalent.

- 122 *Forecasting Principles and Techniques* (3) Johnson
Spring—morning. Survey and appraisal of techniques for measuring the state of business conditions and an examination of current indicators. Study of procedures for estimating future values, namely, budget requirements, price levels, or level of general business activity. Prerequisite: Statistics 51 or the equivalent.
- 155 *Introduction to Mathematical Probability* (3) Kupperman
Fall—evening; spring—evening. Probability distributions, Bayes' theorem and postulate, Bernoulli's theorem and its experimental verification, mathematical expectation, laws of large numbers, limit theorems. Prerequisite: differential and integral calculus.
- 157-58 *Mathematical Statistics* (3-3) Greenhouse
A year course: credit is not given for the first half until the second half is completed. Academic year—evening. Distribution theory, sampling theory, estimation, hypothesis testing, confidence methods, regression analysis, experimental design. Prerequisite: differential and integral calculus.
- 189-90 *Mathematical Probability and Applications* (3-3) Greenhouse
Academic year—evening. Combinatorial analysis, conditional probability and stochastic independence, probability distributions, laws of large numbers, recurrent events, random walks, Markov chains, simple time-dependent stochastic processes. Prerequisite: Statistics 155.
- 191 *Statistical Mathematics I** (3) Bright
Fall—evening. Problems in statistics with the development of processes from modern algebra necessary for their solution. Prerequisite: differential and integral calculus.
- 192 *Statistical Mathematics II* (3) Bright
Lecture (2 hours), laboratory (2 hours). Spring—evening. Linear computations as applied to least squares, multiple correlation, regression, and analysis of variance problems. Prerequisite: Statistics 191 or the equivalent. Laboratory fee, \$9.
- 193 *Statistical Mathematics III** (3) Bright
Spring—evening. Problems in statistics with the development of real variable theory necessary for their solution. Prerequisite: differential and integral calculus.
- 194 *Statistical Mathematics IV* (3) Bright
Fall—evening. Problems in statistics with the development of complex variable theory necessary for their solution. Prerequisite: differential and integral calculus.
- 195-96 *Reading and Research in Business and Economic Statistics* (3-3) Johnson
Academic year—as arranged. Admission by permission of the instructor.
- 199-200 *Proseminar: Theoretical and Applied Statistics* (3-3) The Staff
Academic year—as arranged. In addition to the study of recent advances in statistical methods, this course is designed to coordinate the content of the baccalaureate major. Admission by permission of the instructor.

* Statistics 191 and 193 are prerequisite to all third-group courses.

THIRD GROUP*

201 *Design of Experiments* (3)

Not offered 1960-61. Relative merits of random, repeated, stratified, and double sampling; Fisher-Pitman method of randomization; randomized blocks; Latin squares; factorial design; confounding, partial confounding.

203-4 *The Theory of Econometrics* (3-3)

A year course: credit is not given for the first half until the second half is completed. Not offered 1960-61. Statistical methods applied to analysis of production, supply, and demand; utility and disutility; interest and taxation; exchange. Emphasis on interpretation of results in terms of probability, correlation, and regression of time series. Admission by permission of the instructor.

205-6 *Advanced Business and Economic Statistics* (3-3)

Not offered 1960-61. Application of statistical methods to specific problems utilizing case method when possible. Emphasis on source materials, role of statistical methods, techniques of analysis, interpretation and presentation of results. Original work is required of each student. Prerequisite: Statistics 112 or the equivalent.

207 *Operations Analysis* (3)

Not offered 1960-61. Basic concepts and techniques of operations analysis as applied to problems in business management and economic research. An introduction to the processes of linear programming, game theory, and queueing theory. Admission by permission of the instructor.

211 *Theory of Sampling* (3)

Not offered 1960-61. Fall-1963. Problems of sampling and sample design. Admission by permission of the instructor.

212 *Nonparametric Statistical Inference* (3)

Not offered 1960-61. Spring-1964. Statistical inference when the form of the underlying distribution is unknown; sign tests; rank order statistics; theory of runs; nonparametric discriminant analysis.

217 *Analysis of Variance II* (3)

Not offered 1960-61. Fall-1964. Advanced theory of the applications of the linear hypothesis to research problems. Distributions of the analysis of variance. Extensions to multiple classifications with unequal cell frequencies. Studies of multiple contrasts and their importance. Normal versus non-normal problems.

218 *Correlation and the Chi-square Test II* (3)

Not offered 1960-61. Spring 1965. Theoretical analysis of simple, partial, and multiple regression. Examination of various distributions encountered. Rank correlation techniques and their distributions. Distribution of the chi-square statistic.

257-58 *Advanced Mathematical Statistics* (3-3)

A year course: credit is not given for the first half until the second half is completed. Academic year-evening. Mathematical basis of distribution

* Statistics 191 and 193 are prerequisite to all third-group courses.

functions, moments and cumulants, probability and likelihood, sampling distributions exact and approximate. Chi-square distribution, association and contingency, various conceptions of correlation, individual difference problem, time series, regression analysis, analysis of variance, theories of inference.

259-60 *Advanced Mathematical Probability* (3-3)

A year course: credit is not given for the first half until the second half is completed. 1961-62 and alternate years. Modern theories and asymptotic laws: elementary theory of definite integration; limit theorems in probability.

263-64 *Statistical Inference* (3-3)

A year course: credit is not given for the first half until the second half is completed. Not offered 1960-61. Academic year—1962-63. Sample space; methods for estimating population parameters; fiducial inference and its application to testing hypotheses; valid, efficient, and exact estimation; Students' distribution; variance distribution; sampling statistics. Prerequisite or concurrent registration: Statistics 257-58 or the equivalent.

265-66 *Multivariate Analysis* (3-3)

A year course: credit is not given for the first half until the second half is completed. Not offered 1960-61. Academic year—1961-62. Tests of significance, generalized variance and covariance, tests of independence, canonical and vector correlations, multivariate, normal distribution, generalized Student's ratio, problems of estimation, applications to factor analysis.

267-68 *Characteristic Functions* (3-3)

A year course: credit is not given for the first half until the second half is completed. Academic year—evening. Fourier integrals, set functions, inversion formulas, limit theorems, applications to the distribution problem in statistics.

Kullback

269 *Sequential Testing* (3)

Not offered 1960-61.

270 *Statistical Decision Theory* (3)

Not offered 1960-61.

271-72 *Statistical Information Theory* (3-3)

A year course: credit is not given for the first half until the second half is completed. Academic year—evening. Basic concepts, definitions, and formulas of information theory; their significance and general properties. Shannon's coding theorem, channel capacity, and transmission of information; inequalities of information theory and sufficiency; applications to statistical problems of discrimination and hypothesis testing. Asymptotic distribution theory of information; analysis of contingency tables; loss of information due to grouping and sequential analysis; comparison of experiments.

Kullback

273-74 *Stochastic Processes* (3-3)

A year course: credit is not given for the first half until the second half is completed. Not offered 1960-61. Academic year 1962-63. Fundamental notions of stochastic processes; random walks; Markov processes; differential processes; Gaussian processes; applications.

295-96 *Reading and Research* (3-3)

Academic year—as arranged.

Admission by permission of the instructor.

The Staff

299-300 *Thesis* (3-3)

The Staff

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above the University offers the following courses for students enrolled in the following special programs: Navy Graduate Comptrollership Program, Air Force Advanced Management Program, and Engineering Administration.

101 *Basic Principles of Statistical Methods* (3)

Variables and attributes, averages and dispersion, elementary principles of sampling, introduction to the making of statistical decisions.

119 *The Bases of Statistical Decision Making* (arr.)

Introduction to the techniques of decision making, with emphasis on applications rather than theory. Includes: binomial distribution, normal distribution, Type I and II errors, estimation, research methodology, and problems of inference.

120 *Principles of Statistical Analysis* (3)

Introduction to the basic concepts of statistical analysis, measures of central tendency, dispersion, normal distribution, basic statistical inference including estimation and testing hypotheses.

262 *Managerial Statistics and Quality Control* (3)

The application of statistical principles and practices to management and quality control. Emphasis is placed on the use of statistical techniques in making management decisions, controlling quality and standardization. Prerequisite: Statistics 107 or the equivalent.

SURGERY*

Professor Brian Blades (*Executive Officer*); *Clinical Professors* A. L. Riddick, W. S. McCune, V. M. Iovine, Alec Horwitz, G. A. Higgins, Jr.; *Associate Professor* C. T. Klopp; *Associate Clinical Professor* J. P. Adams; *Assistant Professors* H. C. Pierpont, P. C. Adkins; *Assistant Clinical Professors* B. F. Dean, Jr., Carl Berg, J. S. Neviasser, J. B. Harrell, L. T. Peterson, G. S. Letterman, H. L. Feffer, J. R. Thistlethwaite, Thomas Bradley; *Associates* W. R. Morris, J. J. Weinstein, W. C. Meloy, E. A. Cafritz, K. H. Wood, Isabella Harrison; *Instructors* N. P. D. Smyth, R. K. Hughes; *Clinical Instructors* C. D. Briggs, J. F. Conlon, D. C. Richtmeyer, Leon Gerber, E. A. Gould, A. B. Rohrbaugh, Jr., M. H. Kendrick, B. G. Brown, J. D. Hoyle, R. R. Smith, N. H. Isaacson, C. S. White, Jr., D. P. McCarty, J. M. Keshishian, M. A. Schurter, T. C. Alford, R. L. Dow, L. R. Perna, T. M. Wright, D. C. Wherry

101-2 *Surgical Anatomy I*

Academic year—I hour alternate weeks, as arranged.
relationship between gross anatomy and clinical surgery.

Surgery and Anatomy Staffs
Clinics illustrating
University Hospital.

* The Staff of Instruction here listed is for the academic year 1959-60.

- 284 *Surgical Physiology* The Staff
Spring—2 hours a week. A clinical and laboratory course with particular emphasis on applied physiology.
- 323-24 *Surgical Pathology I* Weiss
Academic year—1 hour a week. Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing surgical specimens.
- 373-74 *Clinical Clerkship I* The Staff
Academic year—as arranged. The student is assigned and required to work up thoroughly the cases for diagnosis and treatment. D. C. General Hospital.
- 375-76 *Outpatient Surgical Clinic* The Staff
Forty hours as arranged during academic year. Surgical clinic. D. C. General Hospital.
- 377 *Fractures and Orthopedics* The Staff
Fall—1 hour a week. Lectures covering the field of fractures and orthopedics. D. C. General Hospital.
- 379-80 *Lectures in Surgery* The Staff
Academic year—2 hours a week. D. C. General Hospital.
- 383-84 *Surgical Clinic* Blades
Academic year—1 hour a week. Demonstration of various surgical diseases to the entire class. University Hospital.
- 473-74 *Clinical Clerkship II* The Staff
Academic year—in rotation. Six weeks, University Hospital; three weeks, Mt. Alto Hospital.
- 479-80 *Surgical Staff Conferences* The Staff
Academic year—Wednesday as arranged. University Hospital.
- 483-84 *Surgical Ward Rounds* Blades
Academic year—1 hour a week. Demonstration of various surgical diseases to fourth-year clerks. University Hospital.
- 491 *Surgical Anatomy II* Horwitz and Staff
Fall—1 hour a week for twelve weeks in rotation. Lectures for fourth-year clerks. University Hospital.
- 492 *Surgical Pathology II* Newman
Spring—1 hour a week. A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically.

UROLOGY*

Associate Clinical Professors E. E. Ferguson, L. R. Culbertson (*Executive Officer*); *Assistant Clinical Professor* W. D. Jarman; *Associates* Gilbert Ottenberg, G. R. MacDonald, F. T. Reuter; *Clinical Instructors* H. D. Wolff, Jr., H. P. Dorman, H. A. Goldberg, W. D. Oldham

* The Staff of instruction here listed is for the academic year 1959-60.

395-96 *Clinic*

Clinical teaching and demonstrations on the care of urological patients with special emphasis on the pre- and post-operative management. Operative clinics and clinical teaching. D. C. General Hospital. The Staff

397 *Urology*

Fall—1 hour a week. Lectures covering the entire field of urology including diagnosis, treatment, and morbid pathology. The Staff

495-96 *Clinic*

Three hours a week, in rotation, as arranged during academic year. Clinical demonstrations, teaching in the Outpatient Department, and urological X-ray conferences, with special attention given to diagnostic procedures. University Hospital. The Staff

ZOOLOGY*

Professors I. B. Hansen (*Executive Officer*), E. E. Mortensen; *Professorial Lecturer* K. C. Kates; *Associate Professor* A. H. Desmond; *Lecturer* J. R. Buchheit

Bachelor of Arts or Bachelor of Science (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, see pages 69-70. The following first-group courses must be included: Zoology 1-2 and Chemistry 11-12.

Required: the general requirements of Columbian College as stated on pages 81-87, and the grade "pass" on the Zoology major examination at the end of the senior year. The correlated knowledge upon which the student will be examined includes the following fields: (1) classification, structure, and ecological relations of animals, both invertebrate and vertebrate; (2) embryological development and life histories of important animal types; (3) general principles of physiology, heredity, and evolution; (4) the development of biological principles, hypotheses, and theories as revealed in the study of the history of zoology.

Master of Arts or Master of Science in the field of Zoology (Columbian College).—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Zoology at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 88-91.

Doctor of Philosophy (Graduate Council).—See page 99.

FIRST GROUP

1-2 *Introduction to Zoology* (4-4)

Academic year: lecture (2 hours)—morning and evening, laboratory (4 hours)—morning, afternoon, and evening; summer 1960. An introduction to the study of the structure, functions, and relation of animals, and of the fundamental biological principles involved. Material fee, \$11 a semester. Mortensen, Hansen

41-42 *Comparative Vertebrate Anatomy* (3-3)

Lecture (1 hour), laboratory (4 hours). 1960-61 and alternate years: academic year—morning and evening; 1961-62 and alternate years: academic year Desmond

* See also the departments of Biology and Botany.
The Staff of Instruction here listed is for the academic year 1959-60.

—morning. Lectures on the organ systems of the vertebrates, laboratory dissections of types. Prerequisite: Zoology 2. Material fee, \$11 a semester.

SECOND GROUP

101-2 *Invertebrate Zoology* (3-3) Mortensen

Lecture (1 hour), laboratory (4 hours). 1960-61 and alternate years: academic year—evening; 1961-62 and alternate years: academic year—afternoon. A systematic study of invertebrate forms, including the morphology, classifications, life histories, and phylogenetic relationships. Occasional field trips. Prerequisite: Zoology 1-2 or Biology 1-2. Material fee, \$8 a semester.

105 *Entomology* (3) Munson

Lecture (1 hour), laboratory (4 hours). 1961-62 and alternate years: fall—morning. A study of the elementary morphology, physiology, and ecology of insects, with an introduction to the taxonomy of the more important groups. Prerequisite: Zoology 1-2 or the equivalent. Material fee, \$8.

138 *Histology* (3) Desmond

Lecture (1 hour), laboratory (4 hours). 1960-61 and alternate years: spring—afternoon; 1961-62 and alternate years: spring—evening. An introduction to the microscopical anatomy of normal tissues and organs. Prerequisite: Zoology 1-2 or the equivalent. Material fee, \$11.

145 *Introduction to Vertebrate Embryology* (3) Hansen

Lecture (1 hour), laboratory (4 hours). 1960-61 and alternate years: fall—afternoon; 1961-62 and alternate years: fall—evening; summer 1960. Origin and early development of the individual, formation of organ systems. Emphasis on the frog, chick, and pig, with reference to the human embryo. Prerequisite: Zoology 2 or the equivalent. Material fee, \$11.

152 *Protozoa* (3) Mortensen

Lecture (1 hour), laboratory (4 hours). 1961-62 and alternate years: spring—evening. Introduction to the protozoa: classification, life histories, and physiology, with special emphasis on free-living types. Prerequisite: Zoology 1. Material fee, \$8.

155 *Parasitology* (3) Kates

Lecture (1 hour), laboratory (4 hours). 1961-62 and alternate years: fall—evening. An introduction to the study of animal parasitology, with a survey of parasitic types from the protozoa through arthropods. Prerequisite: Zoology 1 or the equivalent. Material fee, \$11.

162 *Insect Physiology* (3) Munson

1961-62 and alternate years: spring—morning. Lectures and laboratory work on the physiology of insects. Admission by permission of the instructor. Material fee, \$11.

171-72 *Special Problems* (3-3) The Staff

Academic year—as arranged. Written approval of the instructor is required. Material fee, \$11 a semester.

199-200 *Proseminar* (3-3) The Staff

Academic year—morning and evening. Designed to correlate and supplement the work of Zoology majors.

THIRD GROUP

- 204 *Seminar in Invertebrate Zoology* (3) Mortensen
1960-61 and alternate years: spring-evening. A study of original publications on hormones of invertebrate animals.
- 214 *Advanced Invertebrate Zoology* (3)
Not offered 1960-61. Lectures and laboratory work on problems in invertebrate physiology. Prerequisite: Zoology I and 101-2 or the equivalent. Material fee, \$8.
- 247-48 *Morphogenesis* (3-3) Hansen
1960-61 and alternate years: academic year-evening. Lectures and class reports on experimental morphology. Prerequisite: Zoology 41-42 or the equivalent.
- 251 *Seminar in Vertebrate Zoology* (3) Desmond
1961-62 and alternate years: fall-evening.
- 295-96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1960—Zoology 295 (3). Investi-
gation of special problems.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1960—Zoology 299 (3).

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains four residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance. Forms for application, together with detailed information, may be obtained from the Director of Activities for Women, Woodhull House, 2033 G Street NW. or the Director of Activities for Men, Building Q, 2029 H Street NW.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls (except freshmen) under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives, may live outside the dormitory only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Freshman girls may be domiciled outside the dormitory only with their parents or with immediate relatives with the written approval of their parents.

Women Students.—The Hattie M. Strong Hall provides single rooms at \$45 a month and double rooms at \$40 a month a person.

Dolly Madison Hall provides double rooms at \$40 a month a person.

Men Students.—Welling Hall provides double rooms at \$30 a month a person.

John Quincy Adams Hall provides 69 double rooms each with study alcove and bath. Rooms rent at \$40 a month a person.

Dormitory payments are due and payable in advance on the first day of each month. A student who fails to meet payments when due, but who makes his payment from the tenth to the fifteenth, inclusive, of the month in which payment is due, is charged a service fee of \$2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued rent and a reinstatement fee of \$5.

STUDENT UNION

The Student Union, 2125 G Street NW., is the center for student life. From the cafeteria on the first floor to the reading room on the fourth floor, it is well planned to meet the students' need for meals, study, recreation, and activities. In addition to the recreation lounge and social lounge the Student Union provides office space for the Student Council and for the other major student organizations.

The Student Activities Office, also in the Student Union, has available information concerning the student organizations and campus events.

HEALTH SERVICES

For details concerning the health service program of the University, see "Health Administration", pages 211-12.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor these groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

UNIVERSITY CHAPEL

The University Chapel is maintained as a nonsectarian service of worship for the University community. The service is held Wednesday of each week from 12:10 to 12:30 o'clock at 1906 H Street NW. Among the guest speakers are representative clergymen of Washington. The Director of Chapel is available for counseling and conference.

THE PLACEMENT OFFICE

The Placement Office, 2114 G Street NW., provides assistance to students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which well over 150 private companies, as well as certain government agencies, participate. This program offers outstanding employment opportunities to persons seeking careers.

Students and alumni interested in placement are asked to register in person at the Office and to select from written descriptions of current openings positions for which they wish referral. Those interested in planning careers are invited to study the information on career fields and the brochures of business and industrial organizations, government agen-

cies, etc., which are on display in advance of campus visits by recruiting officers. The services of the Counseling Center (see pages 215-16) are available to students and alumni wishing career guidance.

The Placement Office is open from 9:00 A.M. to 5:00 P.M., Monday through Friday.

INTERNATIONAL HOUSE

International House, 2110 G Street NW., is the social center for students from foreign countries. A series of teas, dances, and other forms of entertainment, and the use of club rooms and lounge enables students to become acquainted and feel at home in the University.

The International Students' Society welcomes as members students from other lands as well as North American students.

The Adviser to Students from Foreign Countries, whose office is in International House, is available for advice and guidance.

STUDENT ACTIVITIES

The University offers a comprehensive program of Student Activities planned to provide a variety of social and recreational experiences which complement the academic offerings.

DIRECTORS OF STUDENT ACTIVITIES

The University maintains the offices of the Director of Activities for Men and the Director of Activities for Women, for the guidance of students in all nonacademic phases of student life, such as student activities, social life, and housing. The directors are available for individual counseling concerning personal adjustment to university life.

STUDENT GOVERNMENT

Student Council

The University believes in encouraging the development of a sense of civic responsibility in its students by delegating to them such authority in student activities as is consistent with established policy and regulations. To this end, the organization of the University includes the Student Council, which, under the guidance of the Directors of Student Activities, is responsible for the conduct of all student activities. The Student Council is elected annually by the student body.

Committee on Student Life

The Committee on Student Life is the judicial branch of the student government. It is composed of not more than seven members of the faculty, two of whom are the Director of Activities for Men and the Director of Activities for Women, appointed by the President of the University, and the following members: President of the Student Council, an Editor

of the *Hatchet*, President of Mortar Board, President of Omicron Delta Kappa, President of the Interfraternity Council, and President of Panhellenic Council. This Committee has the power to review the acts of all student organizations, including the Student Council, and set aside acts that are contrary to established policy and regulations of the University or the Committee.

Approval of Student Organizations.—This Committee is granted authority to approve or disapprove the establishment of any proposed organization on campus. No student club or society (except social fraternities, sororities, scholastic honor societies, religious or professional clubs or societies) organized as a branch or affiliate of a non-George Washington University organization will be recognized by the Committee on Student Life.

ELIGIBILITY OF STUDENT ACTIVITIES

Any student registered in The George Washington University is eligible to participate in nonathletic student activities of the University; however, a student having a scholastic average of less than 2.00 is not eligible to be:

1. A member of the Band, Dance Production groups, Enosinian Debate Society, Glee Club, Cheerleaders, Student Council, Religious Council, Panhellenic Council, Interfraternity Council, Engineers' Council, Student Life Committee, Adams Hall Council, Madison Hall Council, Strong Hall Council, or any publications staff.
2. An officer, permanent committee chairman, or member of the executive board of any activity.

The rules and policies of the Southern Conference govern participation in intercollegiate athletics.

The control and administration of all student activities are outlined in a separate bulletin called "Rules and Regulations Governing Student Activities."

SPORTS ACTIVITIES

The University is a member of the Southern Conference and the National Collegiate Athletic Association. Its teams participate in intercollegiate contests in football, basketball, baseball, tennis, golf, rifle, sailing, and crew.

The University maintains a complete program of intramural sports for both men and women. The men's program is conducted by the Intramural Council. The Women's Athletic Association and Intersorority Athletic Board cooperate with the department of Physical Education in conducting the women's intramural and informal extra-mural sports program in tennis, hockey, basketball, rifle, swimming, golf, bowling, and badminton.

Other sports activities are included in the Fencing Club, Sailing Association, and the Rowing Club.

ARTS

The University offers an opportunity for interested students to participate in dance, drama, forensics, and music through the following organizations: Dance Production Groups I, II, III; Enosinian Debate Society; University Dramatic Production Group; and University Glee Club. Each of these groups presents programs during the academic year.

With the cooperation of the Curator of Art, an annual student art exhibit is presented.

ANNUAL EVENTS

Colonial Program.—The Student Council sponsors a series of ten cultural programs to which all students are invited.

Recreation Program.—The Student Council and the Dance Production Groups arrange dances—square, folk, and social—at frequent intervals for all students.

Homecoming.—Scheduled about the middle of the fall semester, Homecoming is the primary festive period of the school year. It includes the annual Pep Rally and Variety Show, the homecoming football game, and the homecoming dance.

Religion in Life Week.—Observed during the week of Thanksgiving, Religion in Life Week includes special lectures, classroom lectures, and fraternity and sorority discussion groups. Religion in Life Week is sponsored by the University Chapel in cooperation with the Committee on Religious Life and the religious organizations.

Holiday Season.—The University traditionally greets the holiday season with appropriate ceremonies including the lighting of the Christmas tree, the singing of Handel's Messiah, and the observance of a special Christmas service at the University Chapel.

Career Conference.—Under the sponsorship of the Student Council, guest speakers from many professions explore annually with students the potentialities of vocations available on graduation.

May Day.—This is the traditional time for the award of honors in student activities. Mortar Board and Omicron Delta Kappa announce and present their new members.

The Colonial Cruise.—An afternoon and evening cruise on the Potomac in the late spring. Students, alumni, and faculty picnic, dance, and engage in games and athletic contests.

STUDENT ORGANIZATIONS

HONOR SOCIETIES

Phi Beta Kappa.—A national honor society recognizing "outstanding intellectual capacity well employed" in the field of liberal arts and sci-

ences. Senior and junior students who are candidates for the degree of Bachelor of Arts or Bachelor of Science in Columbian College (in exceptional cases, senior and junior students in other nonprofessional divisions of the University) and who have shown broad cultural interests, distinguished scholarly achievement, high character, general promise, and scholarly ideals may, to a number not exceeding 15 per cent of a class, be elected to membership by the Faculty members of the Alpha Chapter of the District of Columbia.

Sigma Xi.—A national scientific honor society, the purpose of which is to encourage original investigation in science pure and applied. Outstanding graduate students in the sciences are eligible for full membership, and undergraduates who have shown marked ability in research may be elected to associate membership.

Alpha Kappa Delta.—A national sociology society.

Alpha Lambda Delta.—A national fraternity established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman women who attain a scholastic average of at least 3.50.

Alpha Omega Alpha.—A national honor medical society.

Alpha Pi Epsilon.—A home economics fraternity.

Arnold Air Society.—A national Air Force ROTC society for advanced cadets.

Delphi.—An intersorority society.

Delta Sigma Rho.—A national forensic society.

Gate and Key.—An intrafraternity society.

Iota Sigma Pi.—A national chemical society for women.

Mortar Board.—A national society for senior college women, stressing leadership, scholarship, and service.

Omicron Delta Kappa.—A national fraternity emphasizing leadership in extracurricular activities.

Order of Scarlet.—A service honorary society for sophomore and junior men.

Order of the Coif.—A national legal society, the purpose of which is to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship. Members are elected each year from the highest 10 per cent of the graduating class of the Law School.

Pershing Rifles.—A national Air Force ROTC society for basic cadets.

Phi Epsilon Phi.—A national botany fraternity.

Phi Eta Sigma.—A national fraternity, established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman men who attain a scholastic average of at least 3.50.

- Pi Delta Epsilon*.—A national collegiate journalism fraternity.
Pi Gamma Mu.—A national social-science society.
Psi Chi.—A national psychology fraternity.
Rho Chi Society.—A national pharmaceutical society.
Sigma Alpha Eta.—A national speech and hearing society.
Sigma Pi Sigma.—A national physics fraternity.
Sigma Tau.—A national engineering fraternity, the purpose of which is to recognize scholarship and professional attainment.
Smith-Reed-Russell Society.—A scholastic society in the School of Medicine. Students of the third and fourth years who maintain a scholastic average of 88 per cent are eligible for associate membership.
Tassels.—A service honorary society for sophomore women.
William Beaumont Medical Society.—A society founded with the object of encouraging and stimulating medical students in work of individual investigation.

PROFESSIONAL ORGANIZATIONS

Alpha Chi Sigma (chemistry), Alpha Kappa Psi (commerce and economics), Alpha Zeta Omega (pharmacy), American Institute of Electrical Engineers—Institute of Radio Engineers (student chapter), American Pharmaceutical Association (student branch), American Society of Civil Engineers (student chapter), American Society of Mechanical Engineers (student chapter), Delta Theta Phi (law), Kappa Beta Pi (law), Kappa Psi (pharmacy), National Student Education Association, Nu Sigma Nu (medicine), Phi Alpha Delta (law), Phi Chi (medicine), Phi Delta Delta (law), Phi Delta Epsilon (medicine), Phi Delta Gamma (graduate), Phi Delta Kappa (education), Phi Delta Phi (law), Pi Lambda Theta (education), Society for the Advancement of Management (student chapter), Theta Tau (engineering).

SOCIAL FRATERNITIES

Sigma Chi, Kappa Sigma, Phi Sigma Kappa, Sigma Alpha Epsilon, Sigma Phi Epsilon, Phi Sigma Delta, Sigma Nu, Tau Kappa Epsilon, Pi Kappa Alpha, Tau Epsilon Phi, Alpha Epsilon Pi, Delta Tau Delta.

SOCIAL SORORITIES

Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Kappa Delta, Phi Sigma Sigma, Zeta Tau Alpha, Kappa Kappa Gamma, Delta Gamma, Kappa Alpha Theta, Alpha Epsilon Phi.

DEPARTMENTAL CLUBS

Case Club, Chemistry Club, El Club Español, Engineers' Council, Enosinian Debating Society, Home Economics Club, Howard E. Kane—A.F.A. King Obstetrical Society, Le Cercle Français, Lester F. Ward

Sociological Society, Pharmacy Council, Phi Sigma Rho (philosophy), Student Bar Association.

RELIGIOUS ORGANIZATIONS

Baptist Student Union, B'nai B'rith Hillel Foundation, Canterbury Association, Christian Science Organization, Eastern Orthodox Club, Lutheran Student Association, Newman Club, Religious Council, Student Christian Fellowship, Unitarian Club, United Christian Fellowship, Wesley Foundation.

STUDENT PUBLICATIONS

Amicus Curiae (Law School publication), *The Cherry Tree* (the annual), *The University Hatchet* (weekly newspaper), *The George Washington Law Review*, *Mecheleciv* (engineers' publication), *The Percolator* (pharmaceutical publication), *The Potomac* (literary magazine).

OTHER ORGANIZATIONS

Adams Hall Council, Alpha Theta Nu (scholarship winners), Big Sisters, Cheerleaders, Colonial Boosters, Colonial Campus Party, Flying Sponsors, Interfraternity Council, Interlaw Fraternity Council, International Relations Club, International Students' Society, Junior Panhellenic Association, Madison Hall Council, Old Men, Senior Panhellenic Association, Strong Hall Council, Student Council, Student Legal Aid Society, University Band, Wandering Greeks, Writers' Club.

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For the purpose of the
dispensary, the following
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persons who have
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the first of January
1871. The names are
given in alphabetical
order, and the names
of the persons who
have received medicine
from the dispensary
since the first of
January 1871 are
given in italics. The
names of the persons
who have received
medicine from the
dispensary since the
first of January 1871
are given in italics.

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the persons who have
received medicine from
the dispensary since
the first of January
1871 are given in
italics.

DEGREES CONFERRED

AND COLLEGE

ANNOUNCEMENTS

AND OTHER

THE UNIVERSITY RECORD

SUMMER TERM 1959

FALL AND SPRING SEMESTERS 1959-60

THE UNIVERSITY RECORD

CHICAGO, ILL. 1900

PUBLISHED BY THE UNIVERSITY OF CHICAGO PRESS

DEGREES CONFERRED

JUNIOR COLLEGE

ASSOCIATE IN ARTS

OCTOBER 17, 1959

Wendell Lloyd Adkins, Jr.
Roy Charles Allen
Richard Maleson Alpher
Manoutchehr Ardalan
May Paulette Argyropoulos
Gary David Badoud
William David Baird
Helen Barbara Banister
Caroline Theresa Barcay
Howard Orr Bash, Jr.
Donald Francis Beach
Beverly Anne Beers
Betty Ruth Bevan
William Frederick Blocher, Jr.
Grover Cleveland Boydston, Jr.
Franklin William Brownstein
Hana Bruml
(With distinction)
Catherine Caillios
David William Canham, Jr.
Thomas Dennien Casale
Robert Henry Cayer
Winn Irwin Chambers
Patrick Edwin Clark
Sandra Jean Clements
Gerald Anthony Cosco
Paula May Diashyn
Alfred Francis Dibbs
John Pierce Donley II
Susanne Laval Evers
Gloria Margarette Farkas
Marion Doris Fischgrund
Mary Ellen Foster
Johanna Deborah Fox
Suzanne Jane Frazier
Brenda Sue Friedenberg
Kenneth Aloysius Fulton
Michael Graham Gallagher
Donald William Garlock
Ellen Geiger
Rebecca Hilliard Gettens
(With distinction)
Chester Harold Gray III
Edwin Neil Gross
Gregory Newton Harney
Susan Porter Harper
George Albert Hawks
Roy Jennings Heinbuch, Jr.
Martin Arnold Hertz
Ernest Hilsenrath
Judith Harriet Holsberg
Evelyn Carole Huston
Joseph Morton Iseman
Dennis Andre Jacques
Myrna Jiménez
Anna Jergens
Alfred Smith Justice
Stuart Lee Kaplan

Va. Charles D. Keilin
Tenn. Ila Meyer Kent
D.C. Diana Joyce Krug
D.C. Elaine Bernadette Lam
D.C. Mary Jane Larocca
Md. Gracia Marguerita Latham
Okla. Donald Joseph Lazas
D.C. Miriam Veronica Lebovic
Va. Wah Lee
Ind. Conrad A. Leongini
D.C. Robert Gipsy Lineberry
Va. Patricia Gamble Mann
Va. Dorothy Johnetta Mathyer
Md. Herbert Maurice Maurer
Ark. Robert Cecil McCandless
R.I. Haynes A McDaniel, Jr.
Va. John Richard McHugh
D.C. George Paul Modrak
Va. Olivia Denniston Morgan
Pa. Merritt Lee Murry
Mass. Robert Earl Nordstrom
Pa. Rosina Orr
Md. Ryland DeLano Packett
Md. Donald Ray Palmer
N.Y. William Herman Peeples, Jr.
D.C. Stuart Jay Petock
Ill. Sanford Norman Plevin
Va. Shirley Phyllis Polinger
N.J. Andrew Joseph Potts
Md. Roy Jerome Power
Pa. Robert Hawthorne Price, Jr.
D.C. Beverly Rita Protas
D.C. Rolando Quiogue
D.C. Sharon Lea Rabinowitz
D.C. Elfriede Ann Remillard
D.C. Cynthia Mason Rhodes
Pa. Sara Rodriguez-Amorós
Va. Waltraud Margarette Rohling
D.C. Pearl Wolkinson Schwartz
D.C. Fleet Senseman
D.C. Afsaneh Sepahpour
D.C. Joan Libby Shinberg
N.J. Richard Alvin Silas
Va. Sheldon Slavin
R.I. Earl Richard Smith
Miss. Alice Ward Sobotka
Va. Robert Gordon Stalnaker
D.C. Charles Egbert Stirling
D.C. Albert Paul Tarasuk
Va. Ronald William Thorstenson
D.C. Phillip Eugene Tull
D.C. Nancy Jean Tully
Va. Wilfred Clifford Vienneau
D.C. Viia Voesar
Va. Gretchen Kateri vonRosenberg
Va. Bettie Sue Wagstaff
D.C. Carl Allen Washenko
D.C. Roselyn Ruback Weil

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Md.
Calif.
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Fla.
D.C.
N.Y.
N.I.
D.C.
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Pa.
Va.
Va.
Md.
D.C.

Natalie Myrna Werber
Gerald M. Wetzler
Willis Boly Wheeler
Judith Gail Wheelus
Herbert Duane Whetstone
Jerry Dean Whitlock

D.C. Richard Martin Wilson
N.Y. Miriam Judith Wondrack
Va. Douglas Kellogg Wood
Md. John Thurston Wright, Jr.
Pa. Ward Drury Wright
Va.

FEBRUARY 22, 1960

Bruce Collett Aabel
Marvin Abramson
David Lyndale Ames
Terese Carole Aronoff
William Haywood Ausman
Robert Keigan Barry
George Benton Beach, Jr.
Irene Marlow Beckwith
Paul Richard Bergeron II
Martin Isaac Bertman
June Elaine Bissell
Edgar George Bowers
James Morrill Bridgman
Anita Jane Brickmann
Marianna Perry Brittis
Gloria Elaine Pitt Cañadas
John Robert Caracciolo
Donald Joseph Cavanaugh
Linda M. Claster
John Hubert Cleary
Peter Glenn Allen Clouse
Edgar Grayson Collins
Sandra Ann Compber
Margaret Ann Connealy
John Frederick Crigler
Roland Carlos Croft
Kathleen Calhoun Crouch
Dorothy Lillian Dockerman
(With distinction)
Ausma Dzenitis
Ann Gail Edelson
Robert Thomas Farr
David Edwin Feldman
Mary Alice Ferris
William Joseph Ferris, Jr.
Lewis Raymond Firth
Lynn Frederick Fischer
David Fouquet
Lois Beverly Foust
(With distinction)
Suzanne S.T. Garner
Desmond Francis Gatti
Jane Claire Giles
Robert Lewis Glazer
Edgar Clifton Good, Jr.
Helene Margaret Harper
Louise Ann Haug
Stanley David Heckman
(With distinction)
Katherine Alma Herckner
Martin Neal Herman
Margaret Elizabeth Herr
Joseph Ellsworth Himes
(With distinction)
Edward John Hino
Aubrey Kenneth Hite
John Barrier Hogg
Mary Electa Holmberg
Patricia Sue Holmes
Toshio Hoshide
John Michael Howard
William Charles Howlin

D.C. Dietrich Harvey Kirkell
D.C. Marcia Suzanne Kirsch
Minn. Joanne Lee Kotzin
D.C. Evelyn Powell Lakes
N.Y. Judy Ann Lane
Md. Joy Annette Lathers
Va. Sam Page Lockard
D.C. Ronald Edward Loughrey
D.C. Mary Elizabeth Macfarland
N.J. John Barry Maguire
Va. Ronald Dexter McGehee
Md. Alger Peter Meidunas
Conn. Abbie Belle Mercer
N.J. Diana Beatriz Merediz
N.Y. Elizabeth Cone Metzel
Va. Milton S. Michaelis
Pa. Dorothea Sophie Michelman
R.I. Martha Jane Mitchell
Pa. Joel Stanley Moien
Va. Anine Ellen Moore
N.C. Giuseppe Morra
Va. Gerald Gamba Morris
Va. Irmgard Muller
Ind. Mary Alice Myers
Utah Leonard William Nesterak
D.C. Harry James Oxford
D.C. Joseph John Paluck
Md. James Henri Poythress
Md. Harvey Benjamin Press
D.C. Phyllis Mary Reynolds
Va. Linwood Adolph Rhodes
D.C. Martha Ann Risher
Md. Gail Rogers
D.C. John William Saadi
Va. Richard Theodore Salazar
Ill. Julian Murray Seidel
D.C. Arthur Garfield Shaffer
Va. Lawrence Hugh Shaw
Va. Catherine Jeanne Simon
D.C. Evelyn Phoebe Slaughter
Pa. Anita Davis Smith
Md. Harry Lee Spear
Va. Michael Bart Spevak
Va. (With distinction)
Ga. Lillian Goldie Spigel
Ala. Roger Winship Stuart II
D.C. Neil Francis Stull, Jr.
N.J. Ross Hain Swope
D.C. Edite Talmanis
D.C. Chester Howard Twentymann
D.C. Russell Thomas Tyser
D.C. Francis Ogden Van Wie
Pa. Miriam Wagner
Pa. (With distinction)
D.C. Elizabeth Barbara Warner
Miss. Evalyn Lee Weedon
Md. Richard Walter Weller
D.C. Glendon Donnell Willey II
Md. Linda Margaret Williams
D.C. Melinda Ann Young

D.C.
D.C.
Conn.
Md.
D.C.

Ohio
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D.C.
D.C.
D.C.
Pa.
Va.
D.C.
N.J.

JUNE 1, 1960

Leslie Abramowitz		Rose Magdalene Frank	D.C.
Rosalie Ann Ackerman	Md.	Judith Roberta Franks	Va.
Sandra Belle Agnew	Va.	Tullius John Frizzi	D.C.
Lamya Ismail Al-Arif	D.C.	Susan Elizabeth Gadsby	D.C.
Robert Kermit Allen, Jr.	Pa.	Carolyn Della Gaines	D.C.
Nicholas Ralph Anzemi	Pa.	John Patrick Gardes	Va.
Spyridon Alexander Aspiotis	Va.	Marjorie Simons Gates	Va.
John Ross Bailer	Md.	Elmer Kenneth Gerlach	Va.
Marilyn Baker	R.I.	Elliot Robert Goldstein	D.C.
(With distinction)		Marvin Norman Gordon	Va.
Betty Josephine Balcom	Md.	Stephen Frank Gordon	N.J.
Bertram Jay Baraff	D.C.	Barry Kenneth Gould	D.C.
(With distinction)		Robert Edward Greenstein	N.J.
Susan Henricks Barbee	Va.	Gwendolyn Fries Greger	Md.
David Hall Bernheisel	D.C.	David Preston Grimes	Va.
John Franklin Bernheisel	D.C.	Robert Muir Gunther	D.C.
Neal Barnett Berryman	D.C.	Ronald Benjamin Guttman	D.C.
Martha M. Berulis	D.C.	Terrence Winfield Hall	Va.
Leah Beyda	Va.	Nancy Jean Hanks	D.C.
Raymond Stuart Black, Jr.	Calif.	Roy Woodrow Harding, Jr.	Va.
Frederick Augustus Bode		Youtha Cordella Hardman	D.C.
(With distinction)		Richard Allen Hardock	N.J.
Maria Elisabeth Bode	Va.	Michael Hartwell	Va.
(With distinction)		Richard Harvey	Md.
John William Boettjer	Ind.	Barbara McAllister Hayes	D.C.
(With distinction)		Joel Roger Hedetniemi	Va.
Beverly Ruth Brester	D.C.	Arnost Heidrich	D.C.
Carol Irene Briggs	Md.	(With distinction)	
John Louisa Brown	Mexico	Peter Hemingway	Md.
Robert Foster Bruce	Md.	David Eugene Herndon	D.C.
Edward Roy Budway	D.C.	Barbara Suzanne Hetson	N.J.
Nan Southey Byrd	D.C.	George Malcolm Hicken	Ind.
Muhittin Erol Caglarcan	D.C.	Dennis Wesley Hill	Va.
Clare Elizabeth Calvert	Turkey	Christopher John Hobbs	Va.
Frank Charles Campana	Va.	John Knight Hord	Va.
Alvin Capp	D.C.	Joyce Cecelia Horton	D.C.
Dorothy Jeanne Carlson	Fla.	Mary Beth Hulsey	Va.
(With distinction)	Va.	James Myers Ingley, Jr.	D.C.
Lawrence Charles Carone		William Horace Ingram	D.C.
Barbara Sue Carter	Md.	Esther Manette Iseman	Va.
Marie-Louise Laure Claveau	Va.	Roberta Joan Isikoff	D.C.
Phillip Gordon Coriel	France	Carol Vine Itchner	Va.
Robert Frederick Corens	La.	Barbara Lou Johnson	D.C.
Spyros Andrew Couris	D.C.	Robert Herndon Johnstone	Md.
Elizabeth Mary Coznick	Greece	Jeanne Margaret Joyce	D.C.
Judith Ellen Crumlish	D.C.	Michael Kachmar, Jr.	D.C.
William Thomas Daly	Pa.	Joan Kaiser	D.C.
(With distinction)	Ohio	Rosalind Harriet Kaye	Va.
Lynda Jann D'Andre	N.J.	Arlene Marian Kevorkian	D.C.
Nancy Elizabeth Davidson	D.C.	(With distinction)	
Isabel Merrick Davies	D.C.	Richard Kazuo Kinoshita	D.C.
Anne Eletheer Warfield Decker	D.C.	Sister Anatilia Klodt	Md.
Beatrice Jo-Ann Decker	Md.	Evelyn Drayton Lane	Md.
Edward Der-Martirosian	Pa.	Lynne Mary Larin	Va.
Roy Lindley DeVecchio	D.C.	Phillip Waple Legg	D.C.
Thomas Francis Dimond	D.C.	Reva Lehman	Va.
Mary Hunter Duncan	Md.	John Gallivan Lent	Conn.
Mary Louise Duncan	Md.	Robert Stephen Levine	N.Y.
David Louis Dunner	D.C.	Sally Kathryn Locker	Brazil
(With distinction)		Alice Naomi Lowenstein	Va.
Edward Ernest Dyson	Va.	William Gloth Magee, Jr.	Va.
Julius Richard Earle, Jr.	D.C.	Charles Robert Major	Va.
Delle Joyce Eichner	D.C.	Harold Eugene Manley	Va.
Hanna Naim El-Asal	D.C.	Marcia Kent Mann	Fla.
Horace Jud Everett	D.C.	Bennett Roy Marshall	Va.
Joseph Falcone	Va.	John Graham Marshall	D.C.
Ann Negus Fink	Va.	Patricia Lee Martin	Va.
Gloria Esther Finkelstein	Va.	Sue Worthington McCandless	Md.
Janet Sue Flocken	D.C.	Jean Ballard McInnis	Md.
Paula Roberta Fortucci	D.C.	Bruce McKeithan	D.C.
(With distinction)	Va.	Elaine Sandra McPhee	Pa.

Herman Richard Menzer, Jr.
 John Michael Metelsky
 Lorraine Rochelle Meyerovitch
 John Richard Miller
 Hazel Cartwright Moore
 (With distinction)
 Mary Elizabeth Moore
 David Michael Moss
 Mary Bartlett Mount
 Mable Moy
 John Stewart Murphy
 Gloria Jean Nethers
 Jean Marian Myers
 Matthew John Nevins, Jr.
 Jerry Mack Newman
 Stephen Jerome Newman
 (With distinction)
 Robert Eugene Nichols
 Enid Eileen Novak
 Nina Legare Obear
 Donald Eugene Oberg
 Robert Francis O'Connor
 Joyce Judson Ormsby
 (With distinction)
 Kaleen Kissinger Heck
 Kenneth Gary Perry
 Dorothy Person
 Jean Franklin Pichler
 Eugene Posati
 Judith Hesse Posner
 Morton Herbert Press
 Sandra Freda Price
 Linda Susana Pryor
 Harry Bryce Qualman
 Pearl Rappaport
 Martin Vester Reece
 Ronald Kenneth Reeves
 Josephine Weaver Regar
 Elizabeth Ann Reid
 Colson Leroy Richey
 Kay Ruth Ridyard
 Gary Lawrence Roffman
 William Norville Rogers
 Sharon Geoghegan Ronningen
 Celia Minton Ruth
 Linda Ellen Schecter
 John Robert Scheider
 Shelia Schlossenberg
 William Albert Schmidt
 Elizabeth Doeve Schoonover
 Carl Donaldson Schultz III
 Edward Saul Schwartz
 Ellen Sara Schwartz

D.C. Bonnie Linda Schwartzbach
 Conn. James Mitchell Scott
 Md. Laura Jane Shouse
 Md. Seymour Norman Shuster
 Va. Jerry Michael Sluger
 Daniel Edmund Solt
 D.C. Peter Ruediger Sommer
 D.C. Richard Lawrence Soulen
 Pa. George Lewis Spectre
 D.C. Joseph Aaron Spitzer
 D.C. G. Jacqueline Swain
 D.C. (With distinction)
 Va. Daniel Albert Taylor, Jr.
 Md. Walter William Teeter
 Va. Helmut Earl Thiess
 D.C. Marcia Herbert Thomas
 Evelina Van Metre Thompson
 (With distinction)
 Ohio James Clinton Threatte
 Md. Carl Wilbur Todd
 Va. James Mauro Tricolli
 Md. Willis Harrison Truitt
 N.Y. David George Tuerck
 Sally Ann Tuomala
 D.C. Robert McLean Turner
 Va. Samuel Spurgeon Turner
 Tenn. Paula Jean Tyler
 Md. Robert Harrison Van Meter
 Pa. John Henry Vogt, Jr.
 D.C. Robert Hayward Volland
 D.C. Thomas Kasper Wagner
 (With distinction)
 Va. John Lawrence Ward
 Conn. William Budd Warden
 Md. Sabina Priscilla Watson
 Md. Marjorie Faye Weiss
 Md. Hedy Lilian Wertheim
 Pa. Harvey Robert Wertlieb
 D.C. Hazel Ethelwyn Whitaker
 D.C. Judith Lee White
 D.C. James Samuel Whitehead
 D.C. Dorothy Frances Williams
 D.C. George Dubar Wilner
 (With distinction)
 Va. John Benjamin Milton Wilt
 Va. Ruth Dee Winters
 N.J. Eileen Ann Wishner
 Md. (With distinction)
 D.C. Ellis Bowman Wisler, Jr.
 Va. Raymond George Yarashus
 D.C. Resa Beverly Zall
 D.C. John Philip Zier
 Md.

COLUMBIAN COLLEGE

BACHELOR OF ARTS

OCTOBER 17, 1959

George Eugene Allison
 Brian Lester Becker
 Robert Samuel Blackwell, Jr.
 Kenneth Warren Buell
 Lucrezia Cecilia Cardascia
 Donald Brand Clapp
 Beatrice Cogan
 Wallace Gordon Dickson
 Jeanne Grabowski Drake
 John Edward Gallagher
 Stylianos John Gratsias
 Roy Guymon

Pa. Ann Yvette Hauptman
 D.C. George Michael Hickey
 Mo. Oscar Donald Hoerr
 D.C. (Special honors in Economics)
 D.C. Mary Ann Hughes
 Va. James Calhoun Humes
 Mich. John Chelsea Hunt
 D.C. Forrest Adrian Jewell
 D.C. Roberta Pompilio Lintner
 Mass. John Lowe
 D.C. Samuel Frank Mallia
 Ill. George Washington Markert III

D.C.
 D.C.
 Va.
 D.C.
 Pa.
 Va.
 D.C.
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 Mass.
 Va.
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 Pa.
 D.C.
 N.J.
 Md.
 Kans.
 Md.
 W.Va.
 Idaho
 Va.
 D.C.
 Md.
 Md.
 N.C.
 Va.
 N.Y.
 Pa.
 Va.
 D.C.
 Md.
 Pa.
 Md.
 Md.

N.Y.
 Md.
 Ohio

N.Y.
 Pa.
 Va.
 Va.
 Va.
 D.C.
 D.C.
 Pa.

Degrees Conferred

413

Mary Alethia Mayes
Lyn McClure
Margaret Mary McHale
Helen Norton Morgan
Thomas Eugene Paine
Frances Kirk Palmer
Marilyn Martin Parkinson
Walter George Pohl
Harriet Betty Presser
Ellen Lautman Rapson
Mary Mitchell Schiffman

Md.	Catherine Mary Shelton	D.C.
D.C.	Jewell Robinson Shepperd	D.C.
Pa.	Barbara Joan Spadetti	Va.
D.C.	Dorothy Chedaker Stevens	D.C.
Va.	Gaile Annabelle Sykes	Va.
Va.	Vito Tanzi	D.C.
Va.	(Special honors in Economics)	
D.C.	Janice Powers Taylor	D.C.
Fla.	Guerdon Saltonstall Trueblood	Wis.
N.Y.	Valerie Page von Mach-Browne	Md.
N.J.	Asa Carter Whitehead, Jr.	Va.

FEBRUARY 22, 1960

Iradj Amini
Cicely Anderson
David Lee Battaglia
Jeanne Meyer Bird
Sandra Sweadner Bourdeaux
Gay Elizabeth Bowen
Richard Ellsworth Brushwood
Enid Sanford Cafritz
Richard Lynn Carroll
Virginia Louise Carteaux
Eleanora Brummer Chatty
Jean-Claude Jacques Chevrier
John Hamilton Clifford
Ellen Condon Dowling
(With distinction)
Peter Sinclair Dyer
Sylvia Lorna Epstein
Nancy Smerling Fogel
Carol Patricia Frankfeldt
Ray Porter Goetz
Frances Bland Greene
(With distinction)
Lillian Guest
Joseph Halow
(With distinction—Special honors
in German)
John Grady Hitchcock
Quentin Daryl Hyatt
Naomi Violetta Koch
Karlota Marie Koester
Dean Franklin Weldner Koolbeck
Mark William Laffin

Iran	Lark Lataner	D.C.
Va.	Ann Mitchell Lewis	Va.
Ill.	Roberta Lee Lohnes	Va.
Va.	Roderick James MacIntosh III	D.C.
Md.	William Alonzo Mambert	Va.
D.C.	Edna Jean McNelis	D.C.
Va.	(With distinction)	
D.C.	Farokh Merat	Iran
Va.	Eldon Stiles Miller, Jr.	Va.
Ind.	Lawrence Alexander Morrison	Va.
D.C.	Maria d'Ourdes Gomez Ortega	D.C.
D.C.	Donald Sharp Palmer	D.C.
D.C.	Alan Monas Perlman	D.C.
D.C.	William Oscar Player III	Va.
Wash.	Edwin Henry Porter	D.C.
Md.	Marguerite Krebs Porterfield	Va.
N.Y.	Robert James Porterfield	Va.
D.C.	Corine Brothers Preston	Md.
Md.	Helen Cherner Rees	Va.
Va.	Robert Ford Robinson	D.C.
Pa.	George Jay Roemer	Va.
Md.	Joseph Emmett Rudmann	Ohio
Pa.	Sidney Phyllis Schiller	Md.
Md.	Amichai Shavit	Israel
Va.	Clara Meyerovitch Silver	D.C.
Pa.	Robert Duncan Sneed	Va.
Va.	Rosalyn Isabel Torchia	Va.
D.C.	Samuel Trychin, Jr.	Va.
S.D.	(Special honors in Psychology)	
D.C.	Edward Vincent Turco	R.I.
D.C.	Wilfred Clifford Vienneau	Va.

JUNE 1, 1960

Amelia M. Albrite
(With distinction)
Carl Robert Anderson
Joyce Berlaime Anenson
(With distinction)
Edith Gisela Backus
Brian Jay Baldwin
Virginus Hobson Banks, Jr.
Joel Beiser
Phyllis Lynn Berg
John Franklin Bernheisel
Estelle Davis Berry
Caroline McDougal Bierer
Mary Fondaw Blackwell
Aija Blitte
Janis Corrine Breckley
Charlotte Harriet Brem
Beverley Andrea Brown
(With distinction)
John Albert Brun
Adelaide Lonsdale Burgin
Catherine Caillois

D.C.	Kenneth Miller Callaway	Va.
Md.	Eleanor Hotchkiss Carter	Va.
S.D.	Thomas Demmien Casale	Pa.
D.C.	Suzanne Rome Chesis	D.C.
D.C.	William Mitchell Clarke	D.C.
Md.	Mary Alice Coates	Va.
Va.	Allen Barry Cohen	D.C.
D.C.	(With distinction)	
D.C.	Gene Maura Cohen	D.C.
D.C.	Ann Sammons Cole	Okla.
Va.	Katharine Virginia Rice Smith Collier	D.C.
D.C.	Theodore Crabill Collins	D.C.
Va.	Alan Hales Coombs	Md.
Md.	Edward Donald Coxen	D.C.
Va.	Carolyn Lenore Custer	Pa.
D.C.	Edward Anthony Dacy	D.C.
Va.	Sarah Edna Dees	Md.
D.C.	William Harold De La Vergne, Jr.	D.C.
D.C.	Dawn Detwiler	D.C.
Va.	Frederick Newton Dibbs	D.C.
D.C.	Sue Caroline Dillon	Va.
D.C.	Thomas Ford Dimon	D.C.

Karen Louise Dreier	Mo.	Charles Brand Parker, Jr.	D.C.
Barbara Marie Edwards	D.C.	Mary Kay Patterson	Va.
Luella Eldridge	D.C.	Roy H. Paxson, Jr.	Fla.
Fred Jewell Engle III	Calif.	Abraham Benjamin Prager	N.Y.
Henry Justin Ferry	Md.	James Eugene Putz	D.C.
(Special honors in Religion)		Martin Hugh Reichgut	D.C.
Sondra Anne Ford	Va.	(With distinction)	S.C.
Laura Belle Frehse	D.C.	Jane Richards	Va.
Mary Nell Gailbreath	Va.	Henri Adrien Richardson	D.C.
(With distinction—Special honors in English)		Aaron Oscar Richman	Md.
John Henry Geerken	D.C.	Harriet Graham Riddle	D.C.
Ellen Jane Gordon	Md.	Sue Abraham Roberts	Fla.
Carrie Lee Gray	N.Y.	Margaret Mary Robertson	Md.
Roderick Michael Groves	D.C.	James Edward Roper	D.C.
(With distinction—Special honors in English)		(With distinction)	D.C.
Gwendolyn Brackett Hambleton	Md.	Leslie Ira Rose	Md.
Rebecca Jane Hanzl	N.J.	Elaine Posner Rosenthal	Va.
Barbara Hardison	Va.	Norman Salzberg	D.C.
Sidney Robert Hersh	D.C.	Vernon Kenneth Sandin	D.C.
Barbara Carlton Hogan	D.C.	Anne Houghton Saporito	N.Y.
Eugenia Lockhart Hothersall	D.C.	Alan Richard Schneider	N.J.
Allan Armstrong Hunter, Jr.	D.C.	Richard Harvey Schwartz	Mass.
Phyllis Joan Hurwitz	D.C.	Carl Donald Scrivener	Iran
Joan Florence Jacobs	Md.	Afsaneh Sepahpour	Ohio
Karen Gale Jamison	Va.	Grant Scott Shotwell	D.C.
DuPre Anderson Jones	S.C.	Abraham Silverstein	Conn.
Elisabeth Campbell Jones	Md.	Thelma Ruth Smackey	Md.
Lettia Katz	Md.	Verla Lee Smith	D.C.
(With distinction)		Louis Frederick Steinkuehler	Va.
Norayr Krikor Khatcherejian	Lebanon	Leslie Elinor Stevenson	Md.
Carol Mayer Khosrovi	Va.	Pearl Blanck Stewart	Va.
Irma Rachel Koski	Mich.	John Garnett Stone III	
Sandra Spivak Kransdorf	Va.	Ruth Priest Strong	
Ella Lublin Krucoff	D.C.	A.B. 1942 Texas Christian University	Pa.
Elaine Bernadette Lam	D.C.	Terrence Sullivan	D.C.
Rodney Lee Leffler	Nebr.	Joan Evans Talbert	N.Y.
Judith Jaffe Lefkowitz	D.C.	Albert Paul Tarasuk	D.C.
(With distinction—Special honors in English)		James Kershaw Tarr	Pa.
Nancy Ruth Leppert	D.C.	Mary Hanzsche Ten Broeck	Va.
Edward Andrew Leslie	Va.	Timothy Charles Tiches	Md.
Gloria Kohler Lester	Md.	Ross Edgar Tomlinson	N.Y.
Lawrence Tolstoi Lobl	D.C.	Beatrice Aboltins Trueblood	D.C.
Helen Vivian Loe	D.C.	Thomas Hulén Truitt	D.C.
Lorraine Wingo Mahaffey	Va.	Donald Joseph Tubridy	D.C.
Jo Ann Margraff	Va.	Wilma Lynn Tulman	D.C.
Patricia Lyon Martin	D.C.	Samuel Spurgeon Turner	Koror-Palau Islands
Jacqueline Josephine Mason	D.C.	Kaleb Udui	Md.
Loring William McAllister	Calif.	Walter Earle Ulrey	Va.
Annette Mosher McFadyen	D.C.	Ilze Veinbergs	Pa.
Elizabeth Ann McGarry	Md.	Susan Kerr Wakefield	D.C.
Timothy Dean Mead	Mich.	Susan Haywood Wells	D.C.
Gilbert Hancock Mende	Md.	Rita Lee Wertlieb	D.C.
Barbara Lester Methvin	Ga.	Milton Dwaine Willford	Conn.
John Paul Methvin	D.C.	Michael Jay Witkin	Conn.
Maryrose Miller	Va.	Douglas Kellogg Wood	Md.
Barbara-Ann Mower	Calif.	Linn Fuller Wood	Hawaii
Elizabeth Hanahan Oliver	D.C.	Ronald Dean Woodward	Calif.
Barbara Mary O'Neill	Mass.	Antoinette Sun Yim	Ohio
		Jacqueline Salter Young	D.C.
		Kathryn Mary Young	
		Tsing Yuan	

BACHELOR OF SCIENCE

OCTOBER 17, 1959

Donald Clive	Md.	William Leigh McKeown
Joseph Alexander Heslin, Jr.	La.	Sylvia Lee Zilber
Jose Mankowski	D.C.	
(With distinction)		

Angelo Bartolomeo Blasetti
Paul Frederick Grant Clarke
Barbara Ann Dodge
Robert Thomas Gross

FEBRUARY 22, 1960

Conn.	Gilbert Louis Maton	Va.
Md.	Patricia Smith McGovern	Va.
Mass.	Enrico Diego Orlando	N.J.
N.Y.		

Hans Ragnar Bode
Elizabeth Ruggles Clark
Anna Nicholas Dekonschin
Paula May Diashyn
Michael William Dix
(Special honors in Chemistry)
Melvin Louis Feldman
Carol Ann Fried
Rebecca Hilliard Gettens
Jane Claire Giles

JUNE 1, 1960

Va.	Ronny Dean Hemmerich	Ohio
Del.	John Andrew Leslie	Va.
D.C.	Richard Emil Linde	Va.
D.C.	Robert Joseph Madican	D.C.
Mass.	Christyna Emma Mecca	Md.
	Celine White Merrill	D.C.
D.C.	William Angus Muir	D.C.
N.J.	Murray Earl Netzer	D.C.
D.C.	Alexandra Howell Scott	D.C.
Md.		

MASTER OF ARTS

OCTOBER 17, 1959

Dorothy Zelia Brewer A.B. 1957, The George Washington University	N.M.	George Joseph Eli Levy A.B. 1949, The George Washington University	Colo.
Robert Robinson Brubaker A.B. 1957, University of Delaware	Pa.	Robert Allen Lewis B.S. 1951, Oregon State College	Oreg.
Donna Lillian Cotton A.B. 1953, University of Maryland	Va.	Virginia Catherine Linden A.B. 1950, University of California	D.C.
Robert Worley Delp B.S. 1947, Davidson College	Md.	David Alan Loiry B.S. in Ed. 1953, Alabama Polytechnic Institute	Md.
B.D. 1951, Theological Seminary of the Evangelical and Reformed Church		Allen Stanley Rowe A.B. 1959, The George Washington University	Md.
Marilyn Patricia Edelin A.B. 1958, The George Washington University	D.C.	Phyllis Magers Sheldon A.B. 1954, Southwest Missouri State College	Mo.
Grace Cecelia Ferrill A.B. 1948, LL.B. 1950, The George Washington University	R.I.	Walter Robert Shorr A.B. 1957, Brooklyn College	N.Y.
Marvin Glassmann A.B. 1957, Brooklyn College	N.Y.	Paul Eppley Spiegler B.S. 1956, University of Maryland	D.C.
Carolyn Myrick Hardin A.B. 1958, The George Washington University	D.C.	John Jefferson Spikes A.B. 1951, Union College	Md.
Theodore Roy Keiser A.B. 1956, Catholic University of America	Fla.	Richard Thomas Stites A.B. 1956, University of Pennsylvania	D.C.
Robert Walter Koernig B.S. 1954, University of Maryland	Va.	James Thomas Suter A.B. 1958, The George Washington University	
A.B. 1958, The George Washington University	Pa.		

FEBRUARY 22, 1960

Jerome Seymore Bernstein A.B. 1957, The George Washington University	D.C.	Virginia Louise Lee A.B. 1957, The George Washington University	Va.
Irene Smith Brittingham A.B. 1956, The George Washington University	Mich.	Edith Sylvia Levitov A.B. 1949, The George Washington University	Va.
Gladys Gilkey Calkins A.B. 1919, Cornell University	Va.	Gustavo Adolfo Mellander A.B. 1959, The George Washington University	Canal Zone
Leonard Richard Carlson A.B. 1952, Michigan State University of Agriculture and Applied Science	D.C.	Mary Jacqueline Porter A.B. 1949, Mary Washington College	Va.
Josephine Ann Curran A.B. 1957, The George Washington University	Md.	John Tremper Randerson B.S. 1949, Union College	N.Y.
Anna Christine Justin B.S. 1939, Texas State College for Women	Texas	Benjamin Victor Reed A.B. 1949, Clark University	D.C.

JUNE 1, 1960

Marcia Geneva Battaglia	D.C.	Katherine Ford Magurn	Md.
A.B. 1955, Colby College		A.B. 1934, Randolph-Macon	
Richard Gordon Berman	Va.	Woman's College	Md.
B.S. 1955, University of Maryland		John Alexander McClure	
Robert Potter Condon	Md.	A.B. 1956, The George Washington	
A.B. 1954, University of Washington		University	Pa.
William F. Courtney	Mich.	Harvey Scott McMillin, Jr.	
A.B. 1947, Miami University		A.B. 1956, Princeton University	Va.
Jonas Leo Goldstein	Calif.	Virginia Cardwell Purdy	
A.B. 1950, University of California		A.B. 1942, University of South	
at Los Angeles		Carolina	Md.
B.L.S. 1951, University of California		Joan Roddy Regnell	
Michael Thomas Kastanek	Md.	A.B. 1954, The George Washington	
A.B. 1956, The George Washington		University	D.C.
University		Doris Elizabeth Smith	
Ana Maria Kuhlman	Mo.	B.S. 1952, D.C. Teachers College	Md.
A.B. 1958, Washington University		Richard Nelson Taliaferro, Jr.	
Marcel Lind	Va.	A.B. 1955, Yale University	Md.
B.S. in B.A. 1952, Municipal		John Smith Thach, Jr.	
University of Omaha		A.B. 1957, The George Washington	
John Carl Lowe	D.C.	University	Vt.
A.B. 1958, The George Washington		David Allan Ulrich	
University		A.B. 1956, The George Washington	
		University	

MASTER OF SCIENCE

OCTOBER 17, 1959

Louis Doazan Bourgeois	D.C.	Stanley Lewis Minken	Md.
B.S. 1951, Howard University		B.S. 1958, University of Maryland	D.C.
Ralph Richard Gray	Utah	Barry Modlin	
A.B. 1955, University of Utah		B.S. 1958, The George Washington	D.C.
Robert Marx Mayer	Md.	University	
A.B. 1957, West Virginia University		Lawrence Malcolm Prescott	
		A.B. 1957, Harvard University	

FEBRUARY 22, 1960

Bernard Feinstein	Md.	Marian Moeller Schnepfe	N.C.
A.B. 1954, University of Colorado		B.S. 1953, The George Washington	
Thomas Kelsall	D.C.	University	
B.S. 1955, Muhlenberg College			

JUNE 1, 1960

Earl Gerald Hoover	W.Va.	Cephas Taylor Patch	Md.
A.B. 1957, West Virginia University		B.S. 1952, Washington and Lee	
Vance Iwao Oyama	Md.	University	D.C.
B.S. 1953, The George Washington		Thomas Knowlton Sawyer	
University		B.S. 1953, American University	

THE SCHOOL OF MEDICINE

DOCTOR OF MEDICINE

JUNE 1, 1960

Rashid Abdullah Ali Abdu	Yemen	Lucille Alberta Anstine	Pa.
A.B. 1956, Lafayette College		B.S. 1956, The George Washington	
Bette Ponack Albert	N.J.	University	Md.
(With distinction)		Helen Constance Bonbrest	
B.S. 1956, Tufts University		A.B. 1958, The George Washington	Va.
Richard Hadley Alley, Jr.	Oreg.	University	
A.B. 1956, Occidental College		Gerald Thomas Bowen	

Degrees Conferred

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Norman James Bru	Calif.	Allen Stiles Gardner	Md.
A.B. 1956, University of California		B.S. 1956, College of William and Mary	
John Richard Bruhn	Ala.	Djamshid Ghatan	Iran
A.B. 1956, Carlton College		A.B. 1956, Susquehanna University	
Keith Elwyn Buchanan	Wis.	Louis Frank Glatch, Jr.	Minn.
B.S. 1956, University of Wisconsin		A.B. 1956, Reed College	
Mary Josephine Burgess	N.Y.	Julius Morton Goodman	Md.
A.B. 1956, Catholic University of America		(With distinction)	
Richard Grant Call	Idaho	A.B. 1958, The George Washington University	
Don Bruce Cameron	Va.	Philip Goodman	N.Y.
A.B. 1952, University of California at Los Angeles		(With distinction)	
Robert Wendell Cantrell	Mo.	B.S. 1956, Union College	
A.B. 1958, The George Washington University		William Gene Grundon	Calif.
David Roland Carlson	Ill.	(With distinction)	
B.S. in Phar. 1953, Drake University		A.B. 1956, San Diego State College	
Robert Lee Carter	W.Va.	Ronad Edgar Gunther	N.J.
A.B. 1955, Washington and Jefferson College		(With distinction)	
Arnold Lowell Case	Va.	B.S. 1958, Utah State University of Agriculture and Applied Science	
A.B. 1956, Yale University		Barbara Jean Haddad	Va.
Donald Overton Castell	Md.	B.S. 1955, University of Miami	
A.B. 1958, The George Washington University		Harold Melton Hagen	Minn.
Robert Joseph Ceremsak	N.J.	A.B. 1956, St. Olaf College	
A.B. 1956, Catholic University of America		Ray Russell Hagley	W.Va.
Irving Allen Chirls	N.J.	A.B. 1957, Marshall College	
A.B. 1947, Harvard University		Lorne Franklyn Hall	Conn.
Robert William Clevenger	N.J.	A.B. 1956, Duke University	
A.B. 1956, Duke University		Eric James Hanson	Va.
Sherwood Allan Cole	Pa.	B.F.A. 1955, Pratt Institute	
A.B. 1956, University of Buffalo		Forrest Glenn Hawkins	W.Va.
Mary Loretto Coleman	N.Y.	A.B. 1956, West Virginia University	
A.B. 1949, University of Chicago		LeRoy Michael Henrich, Jr.	Va.
A.M. 1956, John Hopkins University	Ill.	William Randolph Hix	D.C.
Edward Earl Cunningham		A.B. 1958, The George Washington University	
A.B. 1952, Washington and Jefferson College	Pa.	Charles Edgar Hogg	W.Va.
M.S. 1954, Duquesne University		Masaharu Gerald Jinguji	Wash.
Charles Dennis Daily, Jr.	Mo.	B.S. 1952, College of Puget Sound	
Val Davajan	Calif.	Jack Stoddard Johnson	Utah
A.B. 1956, Stanford University		Severance Burrage Kelley	W.Va.
Jerry DeGroot	Calif.	A.B. 1956, Ohio University	
A.B. 1951, University of Washington		Joseph William Kraut	Ill.
Vincent Louis DeQuattro	Wash.	B.S. 1954, Georgetown University	
B.S. 1955, University of California		Dan L. London	Utah
John Joseph Droscher, Jr.	Calif.	Paul Angelo Manolukas	Va.
A.B. 1951, Colgate University		B.S. 1950, University of Pittsburgh	
William John Duxbury	D.C.	M.B.A. 1955, University of Pennsylvania	
B.S. in Phar. 1952, University of Wisconsin	D.C.	Duncan Keith McDonald	D.C.
Robert Eugene Egeland	D.C.	A.B. 1950, Williams College	
A.B. 1956, State University of Iowa		John Frederick Mermel	D.C.
Elliot Martin Eisenstein	Iowa	B.S. 1956, Georgetown University	
(With distinction)		Dominica Anne Mileto	Md.
B.S. 1956, Franklin and Marshall College	N.J.	A.B. 1956, Hood College	
Michael Anthony Eufemio		Eugene David Mindel	D.C.
A.B. 1956, Cornell University		B.S. 1956, University of Maryland	
Joseph Adolf Evers	N.Y.	Walter Albert Morgan	D.C.
B.S. in Phar. 1953, University of California		A.B. 1958, The George Washington University	
Victor Alexander Fazekas	Calif.	Charles Hammett Myers	D.C.
Edward Joseph Feroli		A.B. 1953, University of North Carolina	
B.S. in Phar. 1955, Massachusetts College of Pharmacy	D.C.	Peter John Nachajski	Conn.
Harold Leopold Floyd	Mass.	A.B. 1956, Brown University	
(With distinction)		Earl Richard Olsen	Wis.
Frank Elwin Gantz, Jr.	Md.	B.S. 1956, University of Wisconsin	
	Md.	Richard Rolin O'Reilly	Pa.
		(With distinction)	
		B.S. 1957, University of Pittsburgh	
		Jerry Michael Parker	Pa.
		B.S. 1957, University of Pittsburgh	

John Douglas Pinkerton	Wis.	Joseph Eric Smith, Jr.	Md.
Willard Samuel Putnam, Jr.	Mass.	A.B. 1956, Washington Missionary College	Va.
A.B. 1944, Harvard University		William Henry Snook	Pa.
William Emanuel Roll, Jr.	Va.	B.S. in Phar. 1952, State University of Iowa	Calif.
Stephen Warren Rozan	N.Y.	George Andrew Solack	Fla.
A.B. 1957, Bethany College		Barbara Ann Solomon	
Norman Marshall Sawyer	Md.	A.B. 1953, A.M. 1954, University of California	
B.S. 1949, U. S. Coast Guard Academy	Del.	Ira David Stein	
David Lloyd Schafer	Conn.	(With distinction)	
Elliott Schiffman		B.S. 1956, Rutgers University	Va.
(With distinction)		Eugene Octave Sykes Stevenson	
B.S. 1957, Yale University	N.Y.	B.S. 1955, The George Washington University	Calif.
Gerald Arthur Schneider		Dale Duane Stewart	Del.
B.S. 1956, College of William and Mary		A.B. 1956, Johns Hopkins University	
James Albert Seeley	Idaho	William Stuart Warren	Conn.
B.S. 1958, University of Idaho		A.B. 1956, Dartmouth College	W.Va.
Seth Thomas Shaw, Jr.	D.C.	Harold Kirk Watson	Calif.
A.B. 1958, The George Washington University		B.S. 1956, Bates College	
Arnold Sheinis	D.C.	Mark Frederick Wildemann	Pa.
B.S. 1948, College of the City of New York		B.S. 1956, University of Maryland	D.C.
Daniel Trundle Shreve	Md.	Max Willfred Yeaman	
Carlos Alberto Silva	D.C.	A.B. 1954, University of California	
B.S. 1956, University of Puerto Rico		Carl Vernon Yutzy	
George Washington Simons III	Md.	(With distinction)	
William Waldo Skeen	N.C.	Bertram Zumoff	
A.B. 1956, University of North Carolina		A.B. 1958, The George Washington University	

THE LAW SCHOOL

BACHELOR OF LAWS

OCTOBER 17, 1959

William McCormick Brown	Md.	Reina Alice Grant	Md.
A.B. 1956, Duke University		A.B. 1956, The George Washington University	Va.
Joseph Jay Bullock	Utah	James Thomas Greenwood	Va.
B.S. 1954, Brigham Young University		B.S. 1954, Pennsylvania State University	Calif.
Charles Augustine Caffrey	Va.	Henry Hansen	
A.B. 1952, Wilkes College		B.S. in M.E. 1951, Drexel Institute of Technology	
Thomas Kohler Cassidy II	Wyo.	Eugene Loyce Holder	
B.S. 1953, University of Wyoming		A.B. 1953, University of California at Los Angeles	
Gay Chin	Va.	A.M. in Govt. 1956, The George Washington University	Ariz.
B.S. in M.E. 1946, Oregon State College		Curtis Arthur Jennings	Va.
Noel Samuel Clifton	Va.	A.B. 1956, University of Arizona	
B.S. 1952, University of Virginia		Arthur Johnson	Va.
Joseph Allen Cook	Md.	A.B. 1955, University of Alabama	
A.B. 1953, University of Maryland		Donald Phillip Kohl	Mich.
Teviah E. Drucker	S.C.	A.B. 1955, Ohio State University	N.Y.
B.S. 1956, University of South Carolina		Thomas Leo Kubani	
Howard Lee Edwards	Utah	B.M.E. 1954, General Motors Institute	
B.S. 1955, Brigham Young University		George Franklin Lesmes	Va.
Gary Dee Fields	Ill.	B.S. 1955, College of the City of New York	N.Y.
B.S. 1956, Iowa State College of Agriculture and Mechanic Arts		Lorenzo Blaine Liljenquist	Vt.
Julius Paul Filcik	Va.	B.S. 1956, Columbia University	D.C.
B.S. in Ed. 1953, Pennsylvania State Teachers College, Indiana		Stephen Briggs Martin	
Philip Benjamin Fischer	N.Y.	A.B. 1954, Wesleyan University	
A.B. 1956, Adelphi College		Edgar Burton May	
William Wendell Garretson	Iowa	A.B. 1952, A.M. 1953, University of Buffalo	
A.B. 1956, Iowa Wesleyan College			
Marion Sherman Gill	Ark.		
B.S. 1954, Arkansas Agricultural and Mechanical College			

Harrison Eugene McCandlish B.M.E. 1952, Polytechnic Institute of Brooklyn	D.C.	James Colvert Robertson B.S. 1957, University of Maryland	D.C.
Gibbon Elliott McNeely B.S. 1950, University of North Carolina	N.C.	Robert Henry Robinson B.S. in Ch.E. 1956, Lehigh University	Pa.
Paul Maurice Moriarty A.B. 1942, Columbia University	Mass.	George Oscar Saile, Jr. B.Ch.E. 1953, University of Cincinnati	Ohio
Armand Girard Morin B.S. 1939, University of New Hampshire	Md.	Manfred Julius Schmidt A.B. 1951, Roosevelt University	Md.
John Faris Myers B.S. 1954, University of Maryland	Md.	Richard Huestis Schmidt A.B. 1954, Middlebury College	Vt.
Donald Steen Olexa B.S. 1956, Pennsylvania State University	Va.	Martin Paul Schwadron B.S. 1956, College of the City of New York	N.Y.
Robert Kessler Painter B.S. 1953, University of Illinois	Md.	Marshall Wayne Sutker B.S. 1954, University of Illinois	Pa.
Walter Eugene Pavlick B.S. in C.E. 1956, Case Institute of Technology	Va.	Leonard Henry Thornton A.B. 1957, University of Vermont	N.Y.
Stanley Durward Perry A.B. 1955, The George Washington University	Va.	Charles Merle Tischler A.B. 1952, M.S. 1954, Columbia University	Va.
William Dial Perry A.B. 1953, Princeton University	Va.	Mary Johnston Turner A.B. 1951, The George Washington University	D.C.
Robert Allen Petrussek B.S. 1954, University of Wisconsin	D.C.	Thomas L. C. Vail A.B. 1956, The George Washington University	Va.
Richard McFarland Pfeiffer A.B. 1949, University of Pittsburgh	Va.	Alson Pharoah White, Jr. B.S. in C.E. 1948, University of Arizona	Ariz.
Joe Weldon Phillips B.S. 1956, Arkansas State Teachers College	Md.	Arthur Emanuel Wilfond B.S. 1956, Drexel Institute of Technology	Pa.
Kenneth Elmer Pruden B.S. 1951, U. S. Naval Academy	Ark.	Jack Haven Williams A.B. 1956, Pennsylvania State University	Pa.
Gerald Francis Richards, Jr. B.B.A. 1956, Niagara University	Md.	Maynard Lee Youngs A.B. 1954, Kalamazoo College	Va.
	N.Y.		

FEBRUARY 22, 1960

Harold Wallace Adams B.S. in E.E. 1954, Purdue University	Va.	Hugh Lee Gordon B.S. in E.E. 1952, University of Maryland	Va.
Victor Agmata, Jr. Ed.B. 1957, University of Hawaii	Hawaii	William Arthur Grant B.S. 1948, University of Pennsylvania	N.Y.
Robert Henry Berdo B.S. 1956, State University of Iowa	Iowa	A.M. 1949, Columbia University	
Gilbert Thomas Brophy B.S. in B.A. 1949, University of Florida	Fla.	Brian Lionel Hall A.B. 1957, University of Nevada	Nev.
Richard Harvey Childress B.S. 1954, U. S. Naval Academy	Ill.	Mary Halow A.B. 1956, The George Washington University	Md.
Granville Hayward Crabtree, Jr. B.S. 1956, University of Missouri	Ill.	William Joseph Hamon B.M.E. 1953, The George Washington University	Va.
Edmund Parke Crump A.B. 1957, The George Washington University	Fla.	Richard Stanley Harsh B.S. 1948, U. S. Military Academy	Va.
Louis Joseph D'Amico A.B. 1956, The George Washington University	D.C.	Donald Allen Hoes B.S. 1954, University of Cincinnati	Va.
Akin Thornwall Davis B.Ch.E. 1953, University of Delaware	Ohio	Arthur Jacob B.S. in M.E. 1954, Massachusetts Institute of Technology	N.J.
Henry Coleman Durham B.S. 1953, University of Kentucky	D.C.	Elizabeth Rodgers Jager A.B. 1945, Smith College	D.C.
John Hart Duvall A.B. 1955, Principia College	Ky.	Kenneth Powell Johnson B.M.E. 1950, Syracuse University	Va.
Francis Bernard Francois B.S. 1956, Iowa State College of Agriculture and Mechanic Arts	Va.	Bruce Neal Kannee A.B. 1957, The George Washington University	Md.
Darrow Glaser A.B. 1957, University of Maryland	Iowa	William Anthony Kemmel, Jr. B.S. 1952, M.S. in Chem. Eng. 1953, California Institute of Technology	Va.
	Md.		

Marie Stuart Klooz	D.C.	Roger Edward Sanders	Ind.
A.B. 1923, Sweet Briar College		A.B. 1951, Indiana University	
A.M. 1939, Columbia University		A.M. 1957, Georgetown University	Va.
Dalphine MacMillan	Pa.	Julian Schachner	
A.B. 1939, Cornell University		B.S. in M.E. 1956, University of	Pa.
Ronald Paul Maddox	Va.	Arizona	
A.B. 1952, Swarthmore College		Royce Wade Snyder, Jr.	
Dimitri Peter Mallios	D.C.	A.B. 1954, Dickinson College	D.C.
A.B. in Govt. 1954, The George		Robert Fred Stauffer	
Washington University		A.B. 1951, University of Wyoming	Va.
Edwin Chester Maska	Va.	Richard Clifton Sutherland II	
B.S. 1953, University of Pennsylvania		B.S. 1955, Virginia Military Institute	Md.
Herbert Dean Morrison	Md.	Donall Hester Sylvester	
A.B. 1955, Principia College		B.S. 1932, Murray State College	Ariz.
Henry Masao Nitta	Hawaii	John George Thomas	
A.B. 1953, University of Hawaii		B.B.A. 1954, University of Miami	Md.
Nicholas Stephen Nunzio	D.C.	Turner Clarence Trippe, Jr.	
A.B. in Govt. 1957, The George		B.S. in B.A. 1942, New York	N.J.
Washington University		University	
John Petsko	Va.	Frank Philip Trocino	Md.
A.B. in Govt. 1949, The George		A.B. 1956, University of Maryland	
Washington University		Richard Norman Wardell	
M.S. 1950, Columbia University		B.S. in Met.E. 1952, Illinois	Ohio
Leonard Rawicz	Va.	Institute of Technology	
B.S. 1953, University of Connecticut		James Godfrey Watterson	
James Donald Reilly	Va.	B.S. in E.A. 1954, Case Institute of	Md.
B.S. 1954, Franklin and Marshall		Technology	
College		Louis Weinstein	
Charles Augustus Robinson, Jr.	Va.	B.S. in E.E. 1955, University of	Fla.
B.E.E. 1950, University of Virginia		Pennsylvania	
Donald Earl Rohall	Md.	Arthur George Yeager	N.M.
A.B. 1956, University of Pittsburgh		B.E.E. 1956, University of Florida	
Joel Bruce Rosenstein	D.C.	Andrew Peter Zimmer	
B.S. 1957, University of Maryland		A.B. 1951, Harvard University	
Ben Frank Roybal	N.M.		
A.B. 1956, New Mexico Highlands			
University			
JUNE 1, 1960			
Horace Palmer Beckwith	N.J.	Samuel William Engle	Va.
A.B. 1954, Maryville College		B.S. 1953, Pennsylvania State	
Stephen Lewis Best	Va.	University	Md.
A.B. 1955, Kenyon College		Alvin Morton Esterlitz	
Ernest Albert Beutler, Jr.	Wis.	B.S. in Ch.E. 1954, Drexel Institute	D.C.
B.S. 1957, Northwestern University		of Technology	
Michael Femow Breston	Md.	Clarice Rose Felder	
B.S. in E.E. 1955, University of		A.B. 1956, The George Washington	D.C.
Maryland		University	
Grover Cleveland Brown	Del.	John Liu Fugh	
A.B. 1957, University of North Carolina		B.S. in F.S. 1957, Georgetown	N.H.
Theodore Locke Brown	Va.	University	
A.B. 1955, Colby College		Laurence Frederick Gardner	N.Y.
Leonard Zinnamon Bulman	D.C.	A.B. 1957, Dartmouth College	
A.B. 1956, University of Maryland		John Fancis Gill	Va.
James Campbell, Jr.	Va.	B.S. in B.A. 1951, Fordham University	
B.S. in E.E. 1956, University of		Vincent Gerard Gioia	
Colorado		Met.Eng. 1956, Colorado School of	Iowa
Elizabeth Elder Cykowski	Va.	Mines	
A.B. 1951, Rutgers University		Gene Wallace Glenn	Va.
Phillip Leroy DeArment	Va.	A.B. 1950, State University of Iowa	
B.S. 1957, University of Pittsburgh		Elmer Ellsworth Goshorn	
Christopher Ogden Duffy	D.C.	B.S. in M.E. 1955, Northwestern	Ky.
B.C.E. 1953, Georgia Institute of		University	
Technology		William Risque Harper	
James Francis Duggan	Md.	A.B. 1956, The George Washington	Del.
B.S. 1953, Georgetown University		University	
Charles Robert Eastwood	D.C.	John Patrick Hazzard, Jr.	
B.S. in M.E. 1946, B.S. in C.E. 1947,		B.Ch.E. 1956, University of Delaware	Canada
University of Virginia		Kenneth James Higson	
M.B.A. 1950, Harvard University		A.B. 1956, McMaster University,	
Sheldon Engelhard	N.Y.	Canada	
B.S. 1957, Lehigh University			

Robert Alfred Johnson B.S. 1950, Ohio State University	D.C.	Harold Sidney Schneiberg A.B. in Govt. 1957, The George Washington University	D.C.
Stuart Kahn A.B. 1957, Indiana University	N.J.	Daniel Woolley Shields A.B. 1949, Princeton University	Md.
William Houston King B.S. in E.E. 1950, University of Kentucky	Va.	George Atley Skoler A.B. 1952, American International College	Md.
George Anest Koutras A.B. 1954, The George Washington University	D.C.	William Andrew Smith III B.M.E. 1950, Catholic University of America	Md.
Gilbert Gerald Kovelman B.E.E. 1956, Cooper Union	Va.	Harrison Michael Spence A.B. 1957, University of Idaho	Va.
Bernard Samuel Leon A.B. 1951, New York University	N.Y.	George Nicholas Stathopoulos A.B. 1957, University of Michigan	Mich.
Aaron M. Levine A.B. 1958, Brooklyn College	D.C.	Samuel Beckner Stone B.S. in E.E. 1955, Virginia Polytechnic Institute	Md.
Allan Matthew Lowe B.S. 1956, University of Maryland	D.C.	Dudley Breckinridge Thomas A.B. 1955, Washington and Lee University	D.C.
Francis Richard Malzone B.S. in Phar. 1953, The George Washington University	Md.	Norman Gilbert Torchin B.S. 1951, The George Washington University	D.C.
Milton Manoukian A.B. 1957, University of Nevada	Nev.	Kenneth Dale Tremain B.S. in Ch.E. 1956, Purdue University	Va.
Philip Michael Marfisi A.B. 1957, University of Nevada	Nev.	Marvin Trimas B.S. in I.E. 1956, Pennsylvania State University	Va.
William Alexander Matthews A.B. in Govt. 1956, The George Washington University	Va.	Wilbur Crandell Tupman B.I.E. 1949, Georgia Institute of Technology	Va.
Roy Miller B.S. in M.E. 1956, University of Washington	Calif.	Anthony Charles Vance B.S. 1954, Pennsylvania State University	Va.
Charles Reese Mitchell B.S. 1951, University of Alabama	Ala.	Richard Whittington Velde B.S. 1953, A.M. 1954, Bradley University	Va.
Gerald Lee Moore B.S. in E.E. 1953, Rose Polytechnic Institute	Md.	Jerry Thomas Verkler A.B. 1954, University of New Mexico	N.M.
Wayne Allen Morse, Jr. B.S. in B.A. 1948, University of Kansas	Va.	Tamara Jaffe Wall A.B. 1955, Lewis and Clarke College	D.C.
B.S. in Ed. 1949, Kansas State Teachers College, Emporia	Md.	Richard Adolf Waterval A.B. 1952, University of Maryland	Va.
Micah Harry Naftalin A.B. 1955, Brandeis University	Mich.	Paul Hesse Welch A.B. in Govt. 1957, The George Washington University	Va.
Carl Alfred Nordberg, Jr. A.B. 1957, University of Michigan	Md.	William Robert Wendt B.S. in M.E. 1935, University of Wisconsin	Va.
Henry Joseph Noyes B.S. 1951, University of Maryland	Iowa	Carl Simpson Whillock B.S. in S.W. 1948, A.M. 1950, University of Arkansas	Ark.
Louis B. Oberhauser, Jr. B.S. in C.E. 1956, Iowa State College	Va.	Gwenda Pryse Williamson A.B. 1948, Vassar College	Md.
Robert Leo Olson B.S. in Eng. 1956, South Dakota School of Mines and Technology	Mich.	Ronald Andrew Willoner A.B. 1955, University of Maryland	Md.
Ursula Elizabeth O'Toole B.S. 1954, Loyola University, Ill.	D.C.	Charles Carroll Maccubbin Woodward B.S. in C.E. 1951, Virginia Military Institute	Md.
John Edward Pawlick B.S. 1952, University of New Hampshire	Oreg.		
Joe Lewis Pecore A.B. 1948, University of Washington	Pa.		
Marie Magdalen Ritz A.B. 1957, The George Washington University	Va.		
Mary Trufant Roark A.B. 1945, Tulane University			

JURIS DOCTOR

OCTOBER 17, 1959

Perry Carvellas B.S. 1952, The George Washington University	Va.	William Harvey Epstein A.B. 1955, B.S. in Ch.E. 1956, Columbia University	N.Y.
Roger Sundal Dybvig B.S. 1955, University of Florida	Va.	William George Evans A.B. in Govt. 1954, The George Washington University	D.C.

Bruce Gregory Klaas	Va.	Stanley Sacks	N.Y.
B.S. in M.E., B.S. in Bus.Mgt. 1956, University of Colorado		B.S. 1954, Queens College	Pa.
Roy Shaw Mitchell	N.Y.	Les J. Weinstein	
B.S. 1957, Cornell University		B.S. in M.E. 1956, University of Pennsylvania	
Richard Lee Raymond	Pa.		
A.B. 1951, Swarthmore College			
M.S. 1956, Indiana University			

FEBRUARY 22, 1960

John Robert Cassidy	Va.	Richard Everett Kurtz	Pa.
B.S. in I.E. 1953, Pennsylvania Military College		B.S. in Eng.Phys. 1955, Lehigh University	Pa.
Lilla Burt Cummings	D.C.	David Foreman McIntosh	Calif.
A.B. 1949, The George Washington University		B.S. 1952, U. S. Coast Guard Academy	
John Powell Diuguid	Md.	Carlton Eugene Russell	Va.
A.B. 1954, Virginia Military Institute		B.S. 1952, U. S. Coast Guard Academy	
John Holte Hagen	Minn.	Mary Helen Sears	D.C.
A.B. 1956, St. Olaf College		A.B. 1950, Cornell University	
John Alfred Henry	Maine	Myron Woodrum Solter	
A.B. 1952, Bowdoin College		A.B. in Govt. 1950, The George Washington University	Va.
John Norvill Jones	Ark.	Peter Van Dyke Wilde	
A.B. in Govt. 1956, The George Washington University		B.S. in Chem.Eng. 1956, Lehigh University	

JUNE 1, 1960

James Chris Cacheris	D.C.	Sheldon Hoard Kinney	Calif.
B.S. 1955, University of Pennsylvania		B.S. 1941, U. S. Naval Academy	D.C.
Dale Louis Carlisle	Wash.	Stanley Melvin Lipnick	D.C.
B.S. in B.A. 1957, University of Idaho		A.B. 1956, Columbia University	
John Cibinic, Jr.	Va.	Bruce Stephen Mencher	Idaho
A.B. 1956, University of Pittsburgh		A.B. in Govt. 1957, The George Washington University	
Richard Clarence Cooper	Mich.	Reed L. Moss	Idaho
B.S. in Ch.E. 1956, Michigan College of Mining and Technology		A.B. 1957, Brigham Young University	
Chester Leslie Davis, Jr.	Mo.	Dennis M. Olsen	N.J.
B.S. in E.E. 1957, University of Missouri		B.S. 1957, Brigham Young University	
William Thomas Fryer III	Md.	James Joseph Romano, Jr.	Maine
B.S. in E.E. 1955, Lafayette College		M.E. 1956, Stevens Institute of Technology	
Earl Leslie Handley	Wyo.	Paul Lewis Rudman	Md.
A.B. 1955, University of Colorado		A.B. 1957, Yale University	
Patricia Roberts Harris	D.C.	Irving Salem	N.C.
A.B. 1945, Howard University		A.B. in Govt. 1957, The George Washington University	
James Hope Hughes	Okla.	George William Warlick	
B.S. 1948, University of Oklahoma		B.S. in E.E. 1956, Duke University	
Alan David Hutchison	N.Y.		
B.S. in B.A. 1956, Ohio State University			

MASTER OF LAWS

OCTOBER 17, 1959

Dorothea Anna Baker	D.C.	Leo Ross	Va.
A.B. 1947, LL.B. 1948, The George Washington University		B.M.E. 1928, Northeastern University LL.B. 1932, The George Washington University	

FEBRUARY 22, 1960

Willis Jerome Ballinger	Va.	Clifford Lawrence Wiser	Md.
Ph.B. 1923, Yale University		B.S. 1952, University of Maryland	
LL.B. 1958, Detroit College of Law		LL.B. 1958, The George Washington University	Calif.
Paul Weatherly Garrett	D.C.	Truman Richards Young	
A.B. 1949, LL.B. 1956, The George Washington University		LL.B. 1932, The George Washington University	
Marion Frank Hersman	Va.		
B.S. 1953, Ohio State University			
LL.B. 1958, The George Washington University			

JUNE 1, 1960

Jerome Aure Barron
A.B. 1955, Tufts University
LL.B. 1958, Yale University
James Edward Cockfield
B.Pet. Eng., M.S. 1953, Ohio State
University
J.D. 1959, The George Washington
University
Albert James Esgain
B.S. in Ed. 1936, A.M. 1938, Ohio
State University
LL.B. 1943, Duke University
Dipl. Int. Law 1956, Cambridge
University, England
David Robert Ficca
B.S. 1953, Fordham University
LL.B. 1959, Georgetown University
Sidney Harris
B.B.A. 1953, College of the City of
New York
J.D. 1957, The George Washington
University

D.C. Patrick Emmett Kilcoyne
B.S. in Com. 1948, Louisiana State
University
D.C. LL.B. 1958, Loyola University,
Louisiana
Cecil Thomas Lakes
A.B. 1948, LL.B. 1950, University of
Cincinnati
Va. Robert Gerald Lauck
A.B. 1949, Municipal University of
Wichita
LL.B. 1954, University of Kansas
Joseph Donald McLaughlin
LL.B. 1941, National University
Pa. Earle Westgate Putnam
A.B. 1950, Dartmouth College
J.D. 1958, The George Washington
University
N.Y. John Joseph Quill
A.B. 1950, Ohio Wesleyan University
LL.B. 1953, The George Washington
University

MASTER OF COMPARATIVE LAW

FEBRUARY 22, 1960

Belma Bayar
A.B. 1950, American College for Girls
A.M. 1954, Istanbul University Law
School
Turkey

JUNE 1, 1960

Rose Marie Sanchez Alonzo
LL.B. 1956, Manuel L. Quezon
University
Yohannes Berhane
A.B. 1952, San Bernardo University,
Ethiopia
Dottore in Giurisprudenza 1956,
Asmara Scuola Di Giurisprudenza

Philippines Jose Soriano Lu
LL.B. 1956, University of the
Philippines
Ethiopia George Greg Morris
LL.B. 1959, Glasgow University
Scotland

MASTER OF COMPARATIVE LAW
(American Practice)

JUNE 1, 1960

Adam Maria Macielinski
LL.M. 1931, Pol.Sc.M. 1934,
University of Lwow, Poland
D.C.

THE SCHOOL OF ENGINEERING

BACHELOR OF CIVIL ENGINEERING

JUNE 1, 1960

James Howard Crist, Jr.
Richard Edward Dame
Robert Michael Gall
John Cullen Judge
B.S. 1954, Union College

Va. George Victor Luckyj
Va. Thomas Edward Miller
Va. Mark Lester Raczynski
Va. Vincent Russell Rice
Arnold Lee Snyder, Jr.
Va.
Wash.
D.C.
Va.
Va.

BACHELOR OF ELECTRICAL ENGINEERING

FEBRUARY 22, 1960

D.C. Robert Oliver Stone
Md.

Patrick Hilbert Cudmore

JUNE 1, 1960

Karl Brecc Avellar
Donald Oliver Baechler
Richard Myron Beard
Jack Huron Bradley
Richard Jackson Byrd
Stephen Karl Dietz
Alexander Graps, Jr.
Ronald Allen Grossman
Albert Ray Howland, Jr.
Edward Parr Johnson, Jr.
A.B. 1953, Dartmouth College
Horace Tillard Jones, Jr.
Anthony Maestri, Jr.
Frank Joseph Mahoney III
Donald Wallace McChesney

D.C. Roger Elton Mulford
Ill. B.S. in Agr. 1936, Cornell University
D.C. Kaname Okamoto
Fla. Gerald Manning Peake
Va. Norbert Joseph Rendler
Va. Donald Otto Schultz
Va. Sheldon Sherman
Md. Robert Egdal Shuken
Va. Leon Henry Sibul
Va. Stanley Robert Soroko
Eleftherios Nicholas Spithas
D.C. Paul Kennedy Stewart
Va. Stanley Tull
D.C. George Hans Urlich

Va.
N.I.
D.C.
Md.
Md.
Md.
Md.
D.C.
Md.
D.C.
Md.
D.C.
D.C.

BACHELOR OF MECHANICAL ENGINEERING

OCTOBER 17, 1959

William Ellsworth Carr
George Caesar Collins

Md. Alec Nathan Lichtman
D.C.

D.C.

FEBRUARY 22, 1960

Daniel Rush Tolliver

Va.

JUNE 1, 1960

Gary Frank Banks
Richard Albert Beuttenmuller
B.S. 1953, College of the City of New York
William Theodore Carey, Jr.
Gerald Keith Cornelius
Lawrence Eugene Earl
John Masao Goto
Guy McLean Jones, Jr.

Va. Robert Kramer
Md. George Koo Lea
Henry Casabianca Mayo
Albert Richard Prince
Va. John William Roberts, Jr.
Va. Robert Charles Russell
Va. Soeseno Sapardiman
Va. William Wallace Stickney III
Va. Earle Wilson Young, Jr.

Va.
D.C.
Va.
Pa.
D.C.
Md.
D.C.
Va.
Md.

BACHELOR OF SCIENCE IN ENGINEERING

OCTOBER 17, 1959

Mark Donald Silverman

D.C.

FEBRUARY 22, 1960

Wayne Alton Davis

Canada Frederic Richard Strub

Va.

JUNE 1, 1960

Edwin Paul Cutler
David Alan Hall
Harold Shigeo Horiuchi
William Drumm Johnston III
Daniel Robert Palmasani
Richard Lee Potterton

Md. Stephen Edward Reymer
Va. Richard Arthur Stokes
Md. A.B. 1953, St. Michael's College
D.C. Stephen Arthur Thau
Md. (With distinction)
Va. Nikita Wells

D.C.
Md.
Md.
D.C.

MASTER OF ENGINEERING ADMINISTRATION

OCTOBER 17, 1959

David Mortimer Falk
B.S. 1943, M.S. 1947, Massachusetts
Institute of Technology
Rolf Fabian Goranson
B.S. in A.E. 1940, University of
Washington

R.I. John Harold Horton
B.S. in M.E. 1948, University of Buffalo
Va. Dwight Eugene Howard
B.S. 1950, Iowa State College of
Agriculture and Mechanic Arts

Va.

Degrees Conferred

425

Harold Louis Kilgore B.S. 1943, Southwestern Louisiana Institute	Ohio	Gus John Pappas B.S. 1956, University of Illinois	Ill.
Rudolph Michael Marrazzo B.S. in M.E. 1951, Pennsylvania State University	Va.	Alfred S. Rhode B.C.E. 1950, College of the City of New York	Md.

FEBRUARY 22, 1960

Maurice Apstein B.S. in E.E. 1932, College of the City of New York	Md.	Howard Erwin Potter B.S. 1955, University of Pittsburgh	Pa.
Howard Busby Hudiburg B.S. in Chem. Eng. 1935, Kansas State College of Agriculture and Applied Science	Va.	B.S. 1957, Pennsylvania State University	
William Frederick Huf B.S. in E.E. 1930, Washington University	Va.	John Calvin Rudisill, Jr. B.S. in E.E. 1956, Duke University	Pa.
Paul Peter McGavin B.S. in I.E. 1952, Lehigh University	Md.	Kenneth Grant Simmons B.S. 1940, U. S. Naval Academy	Ill.
Robert Bruce Partridge B.S. 1936, U. S. Military Academy	Maine	James Albert Strickland B.S. 1947, U. S. Naval Academy	Md.
Jacob Posner B.S. 1941, Queens College	Md.	James Verme B.S. 1951, Boston College	Md.
		Joseph Daniel Wingfield B.S. in I.E. 1951, Virginia Polytechnic Institute	Va.

JUNE 1, 1960

Martin Patrick Callan B.S. in C.E. 1928, Villanova University	Pa.	Douglas Nelson Oler B.S. 1952, University of Maryland	Md.
Carl Guilford Christie B.S. 1929, U.S. Naval Academy	Mo.	Marvin Major Peirce B.S. in M.E. 1949, University of Nebraska	Md.
William Joseph Devereaux B.M.E. 1950, Johns Hopkins University	Va.	Richard Arlen Place B.S. in M.E. 1957, Massachusetts Institute of Technology	Mich.
Leighton Hugh Devlin B.Ch.E. 1954, Johns Hopkins University	Md.	Herman Poggemeyer, Jr. B.S. 1942, U. S. Naval Academy	Kans.
Kenneth Hoge Evans B.S. in Arch. 1953, University of Kansas	Md.	George Prytula, Jr. B.S. in M.E. 1953, University of Rhode Island	Va.
Thomas Mylotte Flaherty B.A.E. 1946, Rensselaer Polytechnic Institute	Md.	Frederick Fenn Quist B.S. in E.E. 1934, University of Idaho	Wash.
Donald Seymour Friedman B.S. in I.E. 1951, Washington University	Md.	Charles Emory Righter B.F.A. 1950, University of Denver	Md.
Joseph John Gwiazdowski B.S. in M.E. 1951, Worcester Polytechnic Institute	Mo.	M.S. 1955, Illinois Institute of Technology	
George Lionel Heap B.S. 1930, U. S. Naval Academy	Pa.	Raymond Oscar Sanders B.S. in M.E. 1948, University of Rochester	Md.
Gerald James Hoffman B.S. in E.E. 1957, University of Buffalo	Va.	Robert Curtis Sedwick B.S. 1949, U. S. Coast Guard Academy	Md.
Charles Chilton Holbrook B.S. in C.E. 1939, University of Maryland	Va.	Francis William Shepherd B.M.E. 1949, College of the City of New York	Md.
Randolph Klippel B.S. 1938, U. S. Naval Academy	N.Y.	M.S. in M.E. 1950, University of Minnesota	
Gerald Martin B.S. in E.E. 1949, University of Denver	Md.	Walter Conrad Stemler E.E. 1950, University of Illinois	Md.
James Allen Miller B.A.E. 1951, New York University	Md.	Don Richard Taylor B.S. in M.E. 1955, Purdue University	Md.
Donald Raymond Mitchell B.S. in Ind. Eng. 1950, Pennsylvania State University	Va.	Kenneth Emerson Woodward B.M.E. 1949, The George Washington University	Va.
		M.S. 1953, University of Maryland	

MASTER OF SCIENCE IN ENGINEERING

OCTOBER 17, 1959

Ernest Walter Brown, Jr. B.E.E. 1955, University of Florida	Va.	Phillip Wonn Mast B.C.E. 1958, The George Washington University	D.C.
Paul William Lavis B.Aero.E. 1949, New York University	Va.		

JUNE 1, 1960

James Francis George	Md.	Chester Charles Kurinsky	Md.
B.S. in C.E. 1951, University of Illinois		B.M.E. 1944, Villanova University	

SCHOOL OF PHARMACY

BACHELOR OF SCIENCE IN PHARMACY

OCTOBER 17, 1959

James Herbert Larner	D.C.	John Richard M-Hugh	Md.
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JUNE 1, 1960

Lawrence Jay Alpert	D.C.	Morton Kousen	Md.
Ronald Lee Block	D.C.	Melvyn Lyon Marks	D.C.
Joseph Byron	D.C.	Harvey Benjamin Press	Va.
Freeman Edward Earley	D.C.	Joseph Thomas Sanders	Md.
Robert Morse Flanagan	Md.	Joseph Saul Shapiro	D.C.
Frederic John Geissel	D.C.	James Parker Shipley	Md.
Harold Theodore Hambricht, Jr.	Md.	Milton Ellis Stewart	Pa.
Allan Wade Hurwitz	Md.	A.B. 1940, University of Virginia	Md.
A.B. 1952, M.S. in Ed. 1954, Syracuse University		Richard Andrew Wills, Jr.	
Anna Jirgens	Va.	David Allan Yevzeroff	

SCHOOL OF EDUCATION

BACHELOR OF ARTS IN EDUCATION

OCTOBER 17, 1959

Marabeth June Adams	Va.	Myrtle Nathlie Madden	Va.
Sait Akkas	Turkey	Elizabeth Lee Orment	Va.
Elaine Bonnie Beckman	Md.	Dorothy Abbott Peck	Va.
Teresa Ann Bishop	D.C.	Thelma Laurine Roberts	Va.
Virginia Anne Bittner	Md.	Harriett Monette Small	Va.
Nancy L. Stevens Brumfield	Ind.	Julius Arthur Spence	Md.
Dorothy Ann Carson	Md.	James Anderson Brown Tipples III	D.C.
Kamuran Cilenti	Va.	Mary Cunningham Toner	Md.
Marjorie Mankin Cooke	N.Y.	Clarke Freeman Trundle	D.C.
Gladys Chapman Frank	Md.	Phyllis Grossman West	D.C.
Miriam Knight Haislip	D.C.	Leila Marie Wiles	
Harold Martin Liberman		Mary Irene Zibelli	

FEBRUARY 22, 1960

Mary Abigal Buxton	D.C.	Barbara Lee Flagg	D.C.
Merle Nan Cantor	Md.	Hazel Kuhns Hershberger	Md.
Betty Jean Carter	Md.	Geraldine Wellman Jacobstein	Md.
Dan Kellogg Darrow	Md.	Mary Suzanne Thomas	
Rhoda Ezrin	D.C.		

JUNE 1, 1960

Nancy Barbara Ackerman	Del.	Ruth Epstein	Va.
Evelyn Marie Baumann	D.C.	Azriel C. Fellner	Va.
(With distinction)		Helen Olive George	Va.
Brenda Welch Belfield	D.C.	Nancy Joan Gillis	Md.
John Charles Bish	D.C.	Martha Ann Goode	Va.
Eva Katharine Blackburn	D.C.	Carolyn Pryde Hall	Va.
Eather Eve Bronstein	Del.	Virginia Sarah Homer	
Mona Carol Byrd	Va.	Gail Sandra Itschner	
Olivia Hines Calhoun	D.C.	Charles Olaf Johnson	
Elaine Cohen	Md.	(With distinction)	
Nancy Ann Costa	Va.	Dorothy Herrmann Jones	
Rona Lynn Englander	D.C.	Irene Wolfe Kimelblatt	
(With distinction)		(With distinction)	

Degrees Conferred

427

Mary Thankful Lake	Va.	Mabel Jean Reid	N.C.
Rebecca Leeds	D.C.	Doris Wilma Sanders	D.C.
Hannah Lipsitz	D.C.	Sylvia Victoria Schroth	D.C.
Margaret Elizabeth McAuliffe	Va.	Marlene Ann Sesso	D.C.
Mabel Leahy McGrath	N.Y.	Gale Vivian Shaver	D.C.
John David Nall	Idaho	Ann Marie Sneeringer	Calif.
Fay Neufeld	D.C.	(With distinction)	N.Y.
Richard Allen Newton	D.C.	Jean Peacock Sonen	Va.
Donald Robert Nicholson	Conn.	Ethel Audrey Spangler	Va.
Georgette-Katherine Palic	D.C.	Rosalie Headley Triplett	Md.
James Kenneth Palmer	D.C.	Donovan Fred Truesdell	Md.
Ruta Marija Penkiunas	Md.	Virginia Claire Walsh	N.J.
Martha Raye Propst	Md.	Joan Rowe Walter	D.C.
Frank Jay Redding, Jr.	Minn.		

BACHELOR OF SCIENCE IN HOME ECONOMICS

JUNE 1, 1960

Priscilla Marie Brown	Va.	Peggy Conway Smith	Va.
Beth Lunde Hulsman	Va.		

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION

OCTOBER 17, 1959

Samuel Ralph Knisley, Jr.	Md.	Ronald Peter Matalavage	Va.
George Hamilton Marshall	D.C.	Joseph Anthony Rosania	N.J.

FEBRUARY 22, 1960

Alvin Dwayne Harkleroad	Tenn.	Barbara Helen Reinwald	D.C.
David Katz	Pa.	Shielamarie Mary Schiffmann	Va.
Saul Eugene Leibowitz	Va.		

JUNE 1, 1960

Howard Orr Bash, Jr.	Ind.	Richard Leo Hutsko	Pa.
Henry Frederick Busky	Md.	Homer Oakley Leigh	Va.
Margaret Ona Cannon	Md.	Dorothy Johnetta Mathyer	Pa.
Ronald Michael De Melfi	Pa.	James Dale Walters	Pa.
John Francis Edmonson	Va.	William Richard Wells	W.Va.
Jane Judge Firey	D.C.		

MASTER OF ARTS IN EDUCATION

OCTOBER 17, 1959

Thomas Joseph Alberghini	Md.	Vernell Dean Canfield	Va.
B.S. in Ed. 1943, College of the Holy Cross		A.B. in P.E. 1955, University of California	
B.S. in P.E. 1952, The George Washington University		Eltse Barnhill Carter	Va.
Pauline Dorothy Altman	D.C.	B.S. in Ed. 1949, Florida State University	
A.B. 1931, Hunter College		Guido Anthony Cavallo	Va.
Lazelle Cooper Barber	Md.	A.B. 1950, The George Washington University	
B.S. 1942, East Texas State Teachers College		Allison Hughes Claggett	Md.
Hoyt Ulmer Brookhart, Jr.	S.C.	B.S. 1941, Maryland State Teachers College, Bowie	
B.S. 1939, Clemson Agricultural College		James Frederick Gilligan	Va.
William Cornelius Boyd	D.C.	A.B. 1954, St. Bonaventure University	Va.
B.S. 1938, D.C. Teachers College		Charles Clifford Goff	
Dwight Clovis Bracken	D.C.	A.B. 1950, West Virginia University	Va.
A.B. 1923, The George Washington University		Joseph Gibson Guter	
Rita Estelle Morine Breedlove	Md.	A.B. 1953, St. Vincent College	Md.
A.B. 1957, Connecticut College		Caroline Valentine Hanna	
Aimee Thomas Brown	Va.	A.B. 1956, Franklin College	
A.B. 1925, University of Minnesota			

Mary Louise Harris	D.C.	Raymond Charles Rolley, Sr.	Va.
B.S. 1949, D. C. Teachers College		A.B. in Ed. 1950, West Liberty State College	Va.
Judith Anita Holzman	Md.	Jacqueline Ann Roy	D.C.
A.B. 1958, Wellesley College		A.B. 1951, Western Maryland College	
John Henry E. Hoppe, Jr.	Va.	Loretta Cecelia Rummage	
B.S. 1940, Washington College		B.S. in Ed. 1953, Pennsylvania State Teachers College, Bloomsburg	Va.
Robert Jeffries	Md.	Baker Omer Shelton, Jr.	D.C.
B.S. 1949, Agricultural and Technical College of North Carolina		A.B. 1928, Washington College	
Edith Harper Johnson	Md.	Warren Webster Smith	
A.B. in Ed. 1950, The George Washington University		A.B. 1951, The George Washington University	D.C.
Lillian Jane Larkin	D.C.	Dorothy Forshier Starr	
A.B. in Ed. 1938, Catholic University of America		B.S. in Ed. 1952, D.C. Teachers College	Md.
Carol Lynn Leonard	D.C.	Horace Edwin Story	
B.S. 1953, Boston University		A.B. 1952, The George Washington University	D.C.
Gilbert Ray Magee	Texas	Lawrence Gordon Strickland	
A.B. 1952, University of Texas		A.B. 1947, The George Washington University	D.C.
Donald Thomas McNelis	Pa.	Paula Barbour Strother	
B.S. in Ed. 1957, Pennsylvania State Teachers College, Bloomsburg		B.S. 1952, D.C. Teachers College	Japan
Florence May Mills	Ala.	Settsuko Suzuki	
B.S. in Ed. 1950, Alabama Agricultural and Mechanical College		A.B. 1956, Meiji Gakuin University, Japan	D.C.
Arthur Ray Mitchell	Va.	Harris Matthew Taylor	
A.B. in Ed. 1954, The George Washington University		B.S. 1952, D.C. Teachers College	Va.
Armeta Frances Molley	D.C.	Raymond Lee Tolson	
B.S. 1938, D.C. Teachers College		B.S. in P.E. 1951, The George Washington University	Va.
Leon Marchal Morton	Md.	Evelyn Wilson Valotto	
B.S. 1956, University of Maryland		B.S. in Ed. 1951, West Virginia University	Md.
Robert Spencer Mullen	D.C.	Fern Florence Will	
B.S. 1951, D.C. Teachers College		A.B. in Ed. 1942, The George Washington University	D.C.
Joseph Edward Penn	D.C.	Jacqueline Smith Williams	
B.S. 1948, D.C. Teachers College		B.S. 1952, D.C. Teachers College	Va.
Yenna York Phillips	Va.	Hazel Gallien Wyson	
A.B. 1941, Alabama College		A.B. 1948, Glennville State College	Va.
Philip Peter Profeta	Md.	Herbert Pentoney Yost	
A.B. 1950, University of Miami		B.S. 1951, West Virginia University	
B.S. in Ed. 1956, D.C. Teachers College			
Elaine Bruce Pryor	D.C.		
B.S. 1954, D.C. Teachers College			

FEBRUARY 22, 1960

Walter Ruffin Battle	D.C.	Virginia Marie Johnston	Ga.
B.S. 1952, D.C. Teachers College		A.B. 1957, Emory University	Md.
Celestine Scott Braxton	Va.	John Matthew Lloyd, Jr.	
B.S. in Ed. 1949, North Carolina State Teachers College, Elizabeth City		B.S. in Ed. 1955, Kent State University	Va.
Albert Penniwell Burkhardt, Jr.	Md.	Manley Albert Miller	
A.B. 1951, Temple University		A.B. 1957, Emory and Henry College	Va.
Miriam Kohl Cameron	Va.	Eleanor Kinsella Morrow	D.C.
B.S. in Ed. 1951, Temple University		B.S. 1929, Columbia University	
Ronald Norman Carpenter	Va.	Harold Henry O'Donnell	D.C.
B.S. in Ed. 1954, Pennsylvania State Teachers College, Slippery Rock		B.S. in Ed. 1935, Ohio University	
Stanley Odell Dellinger	Va.	Mary Malchevich Roskos	Va.
B.S. in Ed. 1956, Madison College		B.S. in Bus. Ed. 1953, Thiel College	D.C.
Jacob Gurin	Md.	Nancy Brick Savarie	
B.S. in Ed. 1941, College of the City of New York		A.B. 1957, Trinity College	Va.
Claudia Carter Hammond	D.C.	Harold Louis Schmoke	
A.B. 1939, Allen University		B.S. 1940, Shaw University	Va.
		Evelyn Jackson Tubbs	
		A.B. in Ed. 1950, Madison College	
		Mallory Hufty Zahn	
		B.S. 1934, Mary Washington College	

JUNE 1, 1960

Marie Kepp Acker	Va.	William Dean Armstrong	Calif.
B.S. in Ed. 1938, Pennsylvania State Teachers College, West Chester		A.B. 1940, Nebraska State Teachers College, Chadron	

Degrees Conferred

429

Gerald Eloi Boisvert A.B. in Ed. 1956, The George Washington University	Md.	Victor Ohanesian B.S. 1949, Springfield College	N.Y.
Juanita Wormley Braddock B.S. 1956, D.C. Teachers College	D.C.	James Earle Phillips, Jr. A.B. 1950, University of Virginia	Va.
Nicholas Bush A.B. 1952, Waynesburg College	D.C.	Selma Eunice Posner A.B. 1942, The George Washington University	Md.
Dorothy Gales Carter B.S. 1940, D.C. Teachers College	D.C.	Margaret Louise Randolph B.S. in Ed. 1937, Asheville-Biltmore College	Md.
Katheryn Dawsey Chapman A.B. 1941, The George Washington University	Md.	Nancy Tusler Redfearn A.B. in Ed. 1957, The George Washington University	Va.
Mary Catherine Cockrill B.S. in Ed. 1951, Madison College	Md.	Mary Ellen Roderick B.S. in Ed. 1937, Massachusetts State Teachers College, Salem	Md.
Rhoda Elaine Coles B.S. 1954, D.C. Teachers College	Va.	Anthony Lawless Rorschach B.S. 1925, U. S. Naval Academy	Va.
Isabelle Cooke Daniels B.S. 1953, Washington College	Va.	M.S. 1952, Columbia University	Pa.
Mildred Dodson Deavers B.S. in Ed. 1954, Madison College	Va.	Lynn Alan Rummage B.S. 1958, Pennsylvania State Teachers College, Mansfield	Pa.
Martha F. Del Genio B.S. in H.E. 1943, University of Tennessee	D.C.	Edward Francis Scott B.S. 1935, U. S. Naval Academy	Mich.
Joyce Diamond B.S. 1951, D.C. Teachers College	D.C.	Ruth Maxwell Scott A.B. 1942, West Liberty State College	D.C.
Nicholas George Dounis A.B. 1953, The George Washington University	D.C.	Mary Dolores Shaw B.S. 1954, Agricultural and Technical College of North Carolina	N.C.
James Albert Everett B.S. in Ed. 1952, Auburn University	Va.	Helen Frances Skopic A.B. in Ed. 1958, The George Washington University	D.C.
Dorothy S. Grant B.S. 1933, D.C. Teachers College	D.C.	Louis Harold Strehlow Ed.B. 1935, Wisconsin State Teachers College, Milwaukee	Colo.
Francis Jeremiah Holland A.B. 1949, Catholic University of America	Md.	Wilma Dee Summitt A.B. 1950, University of Oklahoma	Va.
Richard Crain Jarman A.B. 1958, College of William and Mary	Va.	Harriet Grace Trites A.B. 1927, Wayne State University	Va.
Alvin Carl Jensen Ed.B. 1958, Wisconsin State College	Wis.	McTurner Waid B.S. 1951, Lynchburg College	Va.
Margaret MacKillop Jensen A.B. 1948, University of California	Va.	Kenneth Theodore Waldeck A.B. 1935, Shepherd State College	W.Va.
Mary Lois Kersey A.B. 1926, Florida Southern College	Fla.	Olie H. Walker B.S. 1942, Maryland State Teachers College, Salisbury	Md.
Robert Michael Leverone A.B. 1952, Harvard University	Ohio	Donald Eugene Walls A.B. 1958, Eastern Baptist College	D.C.
Myrtle Nathalie Madden A.B. in Ed. 1959, The George Washington University	Va.	Minnie Shumate Woodson B.S. 1941, D.C. Teachers College	D.C.
Ernest Bernard Mercer B.S. 1942, D.C. Teachers College	D.C.	Ching Chi Wu, A.B. in Ed. 1945, National Central University, China	Republic of China
Mabel Maxwell Montgomery B.S. 1942, Westminster College	Va.	Hsien-Ching Wu Lee A.B. 1948, National Central University, China	Republic of China
John Threston Morgan A.B. in Ed., B.S. in B.A. 1952, Shepherd State College	W.Va.	Vincent Joseph Zugay B.S. 1955, Pennsylvania State Teachers College, Indiana	Md.
Kunigunde Marie Mueller A.B. in Ed. 1954, The George Washington University	N.Y.		

ADVANCED PROFESSIONAL CERTIFICATE

JUNE 1, 1960

Roy Alexander Fry A.B. 1950, Iona College	Va.	Helen Elizabeth McMahon B.S. 1947, Ed.M. 1952, University of Maryland	Md.
A.M. in Ed. 1956, The George Washington University		Ester Swire A.B. 1931, A.M. 1932, Cornell University	Va.

DOCTOR OF EDUCATION

OCTOBER 17, 1959

Sue McGlaughan Brett
A.B. 1924, A.M. 1936, University of
North Carolina
Dissertation: "Practices of System-wide
English Supervisors in the Public
Secondary Schools of Large Cities:
An Appraisal"

Md. Virginia Randolph Kirkbride
A.B. 1941, A.M. 1942, University of
Nebraska
Dissertation: "Group Approaches to
Student Personnel Services in High-
er Education"

Neb.

JUNE 1, 1960

William Benjamin Evans, Jr.
B.S. in Ed. 1940, University of
Maryland
A.M. in Ed. 1946, Columbia University
Dissertation: "Selected Preparation and
Experience Background Factors as
Related to Three Aspects of Pro-
fessional Activities of Elementary
School Principals"

D.C.

THE SCHOOL OF GOVERNMENT
BACHELOR OF ARTS IN GOVERNMENT

OCTOBER 17, 1959

Tatiana Akhonin
Howard Irvin Crawford
Frederick William Gibb II
Thomas Joseph Harrigan
Margaret Irene House
Celia Edith Lightner Jensen
Max Sherwood Jones
Daniel Sungil Juhn

D.C. Frank Joseph Komenda
Md. Leslie Joseph Munroe
D.C. Allan Rudolph Plumley, Jr.
Va. Owen Everett Robinson
Wyo. Charles Joseph Surprenant
Mich. Nicholas Vartzikos
Md. Donald Lewis Witz
Korea

D.C.
Calif.
Del.
Md.
Wia.
Va.

FEBRUARY 22, 1960

Linda Lou Abbot
Lee Lemmon Benton, Jr.
Philip Alvin Buttram
Trinh Van Chan
Harold Glenn Claiborn
Dean Suter Clatterbuck
Bartholomew Joseph Crievello
William Spalding Davis
Kenneth Wayne Eriksson
Robert Mulliner Frame
William Peter Frank
Alan Barry Freidin
Joel Friedman
Lewis Gold
John Yarling Harrison
Donald Charles Herman
Aubrey Bennett Jones, Jr.
Ralph Gubler Jorgensen

D.C. William Thomas LaCorte
Va. Thomas Hugh Neuhauser
Va. Garvin Lee Oliver
South Viet Nam Gerald Lynn Osborne
Mo. Michael Patchan
D.C. Andrew Jeremiah Patt
D.C. Roy Leon Paugh
Md. Lowell David Peart
D.C. Marjorie Hildebrandt Raynor
Va. Reva Rona Rosenberg
D.C. Conrad Laird Russell
D.C. Isadora Lippman Semsler
Va. William Edward Stanton, Jr.
Md. Carlton Francis Steep
Pa. (With distinction)
Pa. Selma Stein
Md. Thomas Clair Varley
Md.

Va.
Md.
Ill.
Va.
Md.
Md.
D.C.
D.C.
Va.
D.C.
Md.
D.C.
Va.
Md.
N.Y.
Pa.

JUNE 1, 1960

Robine Juliet Andrau
Spyridon Alexander Aspiotis
Chris Balodemas
Shirley Barlow
Theodore Joseph Baroody
William Beeber Belford
William Henry Blake, Jr.
(With distinction)
Michael Patrick Brinker
Richard Clay Brown

N.Y. John Henry Callow
Va. Stephen Chatrnick
D.C. Suk Hong Choi
Va. Marshall Francis Curatolo
Va. Thomas Edward Duke
Va. Stuart Marlin Engleberg
Mo. Craig Lambert Fox
D.C. Michael Graham Gallagher
N.M. William Edward Gavaghan
Stuart Harold Gelber

Va.
N.Y.
Korea
D.C.
Md.
Md.
Va.
Va.
N.Y.
Conn.

Alan Jason Goldstein	D.C.	Joseph Adolph Miller	Md.
Joe David Haney	D.C.	Robert E. Millious	Va.
Ross Edward Heasley	D.C.	Roger Owen Moore	Ohio
Marilynn Frances Hoffman	Ohio	Stanley William Orlinsky	N.J.
Richard Cabot Howland	N.Y.	Stephanie Davis Papadopoulos	D.C.
Louise Clark Huston	Va.	Barbara Bones Phillips	D.C.
Catherine Marie Hyland	Md.	Warren Clayton Poe	Md.
Walter Hiroshi Ikeda	Hawaii	Vicki Lynn Powers	Ill.
Frank James Kapitan, Jr.	Va.	Roger Williams Preston	Conn.
Charles Raeburne Landon, Jr.	Va.	Victor Jerome Rosenberg	D.C.
Roger Allan Lawson	Va.	Charles Salzberg	Va.
Frank Lynford Lewis	Va.	Carl Miller Snavely, Jr.	Va.
Melvin Eugene Long	Md.	Kate Douglass Storey	D.C.
Richard Sides Lykes	Texas	William Graves Talentino	Md.
Stephen Charles Matula	Pa.	Marion Dorinne Thompson	Pa.
David Wesley McCloughan	Md.	Robert Paul Tucker	Md.
John Joseph Maxwell McQueary	D.C.	Phillip Eugene Tull	D.C.
Richard Murnick Merelman	D.C.	Theodore Weiss	D.C.
(With distinction)		Albert Douglas Weldon	D.C.
Allen Howard Miller	Va.	Valentine Zabijaka	N.Y.

MASTER OF ARTS IN GOVERNMENT

OCTOBER 17, 1959

Norman Barton	Wis.	Alexander Harrison	Md.
B.S. 1957, University of Wisconsin		A.B. in Govt. 1953, The George Washington University	
Mae Adele Berrian	Mo.	Sally Anne Jumper	D.C.
A.B., B.Mus. 1932, Bethany College		A.B. 1936, Connecticut College	
A.M. 1947, Stanford University		Gordon Anthony Murphy	N.Y.
A.M. in P.A. 1956, The George Washington University		B.B.A. 1950, St. Bonaventure University	
Carl Roy Borchers	Va.	Frank Perley Reiche	N.Y.
A.B. 1955, Wagner Lutheran College		A.B. 1951, Williams College	
Kathleen Duncan Crouch	Va.	LL.B. 1959, Columbia University	
B.B.A. 1957, Georgia State College of Business Administration		Eleanor Sue Smith	D.C.
David John Harris	Md.	B.S. 1942, Mississippi State College	
A.B. 1954, William Jewell College			

FEBRUARY 22, 1960

James Charnel Anderson	La.	W. A. Copeland	Okla.
A.B. 1958, McNeese State College		A.B. 1956, University of Oklahoma	
Robert Greeley Barnes	Mich.	John Danhouse Martz III	Pa.
B.S. 1953, U. S. Naval Academy		A.B. 1955, Harvard University	
Carmel Martha Cassidy	D.C.	Henry Carl Newman	Ill.
A.B. 1956, The George Washington University		B.S. 1949, University of Illinois	
Francis Xavier Cavanaugh	D.C.	Edward Djanner Sinaga	Indonesia
A.B. 1954, Northeastern University		A.B. 1956, North Sumatra University	

JUNE 1, 1960

Ronaldo Costa	Brazil	Charles Wesley King	D.C.
LL.B. 1955, Catholic University of Rio de Janeiro		A.B. 1957, Washington and Lee University	
Mikulas Franeck	D.C.	Maurice Kogon	Md.
LL.D. 1935, Comenius University, Czechoslovakia		A.B. in Govt. 1959, The George Washington University	
Patricia Ann Hiles	D.C.	Barbara Rita Still	Va.
A.B. 1957, Long Beach State College		A.B. 1956, Woman's College of the University of North Carolina	

MASTER OF ARTS IN PERSONNEL ADMINISTRATION

OCTOBER 17, 1959

Paul Russell Goodwin	Md.	Robert Joseph Lavoie	Wash.
B.S. in Forestry 1931, University of Maine		A.B. 1953, Syracuse University	

FEBRUARY 22, 1960

Gene Pete Chufar
A.B. 1952, Ohio University

Md. Betty Depp Grossnickle
A.B. 1952, Duke University

N.C.

JUNE 1, 1960

Mason Strother Cartmell, Jr.
A.B. 1956, University of Maryland
Ruth Eleanor Hagerling
B.S. in B.A. 1940, Nebraska Wesleyan
University

D.C. Robert Center Minor
A.B. in Govt. 1952, The George
Washington University
Va. James Rogers Thomas
B.S. 1950, Columbia University

Md.

Va.

MASTER OF ARTS IN PUBLIC ADMINISTRATION

OCTOBER 17, 1959

Henry Monroe Dalsheim
A.B. 1948, The George Washington
University
Robert Jackson Davis
B.S. 1957, University of Maryland
Douglas Ray Earich
A.B. 1949, Lebanon Valley College
Edmund Lauder
B.S. in Mil.Sc. 1956, University of
Maryland
William Edward Lavery
B.S. 1953, Michigan State University
of Agriculture and Applied Science

D.C. Joseph Neal Pamplin
B.S. 1958, University of Maryland
N.J. Frederick Paul Selin
B.S. 1958, University of Maryland
Md. Leland Wrightman Smith
A.B. in Govt. 1956, The George
Washington University
Md. Lewis Austin Swartz Tomlinson
B.S. 1951, Pennsylvania State University
Va. Henry Willard Tubbs, Jr.
A.B. 1949, Monmouth College

Va.

Ill.

Va.

Va.

Va.

FEBRUARY 22, 1960

Marian Therese Hankerd
B.S. 1937, Nazareth College

Mich. Bernard David Rifkind
B.S. in Com. 1941, Temple University

D.C.

JUNE 1, 1960

Ralph Aaron Daniel
B.S. in Agr. 1946, University of
Arkansas
A.B. 1959, The George Washington
University
Richard Michael Haddad
A.B. 1955, Wayne State University
Clare Worden Hendee
B.S. 1930, Michigan State University
of Agriculture and Applied Science
Ernest Ludwig Kvan
A.B. 1947, University of Washington

Ark. Robert Phelps Moody
B.S. 1958, University of Maryland
John Francis Smith
J.C.B. 1940, J.C.L. 1941, Catholic
University of America
Mich. Richard Andre Steele
B.S. 1955, Trinity University
Md. John Joseph Sullivan
B.B.A. 1953, University of Miami
Va. Russell Abner Wood
B.B.A. 1953, University of Miami

Tenn.

D.C.

Tenn.

N.D.

Fla.

MASTER OF BUSINESS ADMINISTRATION

OCTOBER 17, 1959

Julian Ray Abernathy, Jr.
B.S. 1957, University of Maryland
John Burton Algeo
B.B.A. 1948, St. Mary's University
Edgar Jacob Becker
B.S. 1957, University of Maryland
Daniel Joseph Boyle
B.S. 1950, University of Maryland
Rex Lee Brouillard
B.S. 1957, University of Maryland
Archie Enos Cameron
B.S. in Comm. 1941, Ferris Institute
Wallace Horace Cameron
B.S. 1956, University of Maryland
Burton Sherwood Carnegie
B.S. 1958, University of Maryland

Ark. Richard Blake Cheatham
B.S. 1958, University of Maryland
Va. Seymour Irving Colman
B.S. 1956, University of Maryland
Va. Milton Stuart Compton, Jr.
B.B.A. 1948, Kent State University
Pa. James Marlo Fielder
B.S. in Comm. 1947, Louisiana State
University
Ohio Cecil Robert French
B.S. 1950, University of Alabama
Minn. Dorrie Edwin Jones
B.S. 1958, University of Maryland
Va. Norris Rutledge Kincaid
N.Y. B.G.S. 1953, Louisiana State University

Tenn.

Maine

Ohio

Md.

Ala.

Calif.

Fla.

Robert Burr Lovingfoss B.S. 1957, University of Maryland	Ill.	Kenneth Leslie Sandvig A.B. 1941, Augustana College	S.D.
Cecil Stanford Martin B.S. 1958, University of Maryland	Texas	Milton John Scott B.S. 1958, University of Maryland	Wis.
James Joseph McCann B.S. in Mil.Sc. 1958, University of Maryland	N.J.	Alan Bronson Smith, Jr. A.B. 1946, Ohio Wesleyan University	Ohio
Martin Everett McCoy, Jr. B.S. 1944, U. S. Military Academy	La.	John Leon Susott B.S. 1944, U. S. Military Academy	Ind.
James Vergil Merritt B.S. 1958, University of Maryland	Ala.	Ira Ely Wessler A.B. 1956, St. Lawrence University	N.Y.
Niilo Nieminen B.S. 1956, University of Maryland	N.Y.	James Peterson West B.S. in Mil.Sc. 1952, University of Maryland	Calif.

FEBRUARY 22, 1960

Howard Valentine Brennan A.B. 1958, The George Washington University	Va.	Render Paul Hammond B.S. in B.A. 1956, University of Richmond	Va.
Eugene Joseph Cronin, Jr. A.B. 1947, Bowdoin College	Maine	Frederic Wilson Muir B.S. 1938, U. S. Naval Academy	Calif.

JUNE 1, 1960

Earl William Alexander B.S. 1945, U. S. Merchant Marine Academy	D.C.	Graham Hall B.S. 1951, U. S. Coast Guard Academy	Conn.
A.B. in Govt. 1959, The George Washington University		Perry Hall B.B.S. 1942, U. S. Naval Academy	Va.
Clayton Leigh Anderson A.B. 1940, Wayne State University	Mich.	Victor John Hawthorne A.B. 1948, DePauw University	Fla.
Jack Otis Arford A.B. 1938, The George Washington University	Okla.	Ervin F. Hodge B.S. 1954, Tulane University	Fla.
Raymond Henry Bates B.S. 1944, U. S. Naval Academy		John Roland Johnson B.S. 1944, U. S. Naval Academy	Minn.
Eugene Benjamin Berger B.S. 1942, Syracuse University	Mass.	Charles Robert Kennington, Jr. B.S. 1949, Kent State University	Ohio
Ed.M. 1958, University of Mississippi	N.Y.	William Henry Mayer B.S. in Com. 1952, Rider College	N.J.
Robert Wayne Calvert A.B. 1959, The George Washington University	Kans.	Huston Burns McClure A.B. 1938, Indiana State Teachers College	D.C.
William Warwick Coons B.Ch.E. 1948, Georgia Institute of Technology	Ga.	David Willis McFarland A.B. 1942, University of California at Los Angeles	Calif.
John Chase Crimen B.B.A. 1948, University of Texas		Harold Evans McKinney B.S. 1951, Iowa State College of Agriculture and Mechanic Arts	Mo.
Ovid Milton Davis A.B. 1949, Ohio University	Ohio	William Maxwell Oller B.S. 1946, U. S. Naval Academy	Pa.
William Thomas Duba B.S. 1958, University of Maryland	R.I.	Charles Raymond Poppe, Jr. B.S. 1951, University of California	Calif.
Karl Frederick Eickemeyer A.B. 1941, Oberlin College	Ohio	Craig Elbert Randall B.S. 1944, U. S. Naval Academy	Md.
Arthur Thomas Friend B.S. 1955, University of Pennsylvania	D.C.	Paul Bridges Smith B.S. 1941, U. S. Naval Academy	N.Y.
Gerald Francis Gordon A.B. 1958, Minnesota State College, Mankato	Minn.	Grant Snyder B.S. 1948, Syracuse University	N.Y.
Hugh MacLean Gray B.S. in Ed. 1941, Boston University	R.I.	Frank Leroy Spillman B.S. 1944, U. S. Naval Academy	Kans.
Elynn Everett Hagedorn A.B. 1951, University of Texas	Texas	Abe Mahnoud Tahir, Jr. B.B.A. 1953, University of Mississippi	Va.

DOCTOR OF BUSINESS ADMINISTRATION
JUNE 1, 1960

Wilbur Earle Benson A.B. 1951, M.B.A. 1952, The George Washington University	Va.
Dissertation: "A Comparative Analysis of Insured Commercial Banks in Washington, D.C., and Baltimore, Md., 1956"	

COLLEGE OF GENERAL STUDIES

ASSOCIATE IN ARTS

OCTOBER 17, 1959

Daniel Stewart Alexander
Oliver Reeves Davis
Francis Joseph Donnelly
Joseph Charles Gillium
(With distinction)
Glenn Roy Grimm
Gerard James Grogan
Clyde Kirtley Keith
Allen Joseph MacGill III

Va. Charles W. Macks
Ga. Robert Charles McCormack
Va. Sidney Rollins Overall, Jr.
Va. (With distinction)
Tom Solomon Parker
Va. (With distinction)
Va. Joseph John Pessa
Va. John Charles Studt
Fla. Paul Girard Swope

Pa.
R.I.
Mo.
Va.
N.J.
Va.
D.C.

FEBRUARY 22, 1960

Charles Joseph Bauer
Edward Lee Carpenter
Arthur Newell Fearing
Richard William Goodale

Va. Mary Elizabeth Hannon
Wash. Edward George Troell
D.C. Franklin Raymond Wallace, Jr.
Mass. George Burdette Woodworth

D.C.
Va.
Minn.

JUNE 1, 1960

Maxwell George Allen
(With distinction)
Earl Randolph Baldwin
Clifford Fred Bates
(With distinction)
Ollie Burkett, Jr.
Eugene James Carroll, Jr.
Robert Howard Clark
Noeline Freda Darling
Bruce Johnson Dietz
William Henry Disher
(With distinction)

Va. Ephraim Everett Fowler, Jr.
Charles Emil Johnson
D.C. (With distinction)
N.Y. Eugene L. Kilcullen, Jr.
Va. Clarence Charles King
Va. Charles Frederick Liebrecht
Va. Edward John McCarthy
Va. Harry Taylor Shiveley
Calif. Glen Richard Smith
James Hamilton Todd
Va. Richard Alvord Ward
(With distinction)

S.C.
Va.
Pa.
D.C.
Va.
Va.
Ill.
Wash.
Calif.

BACHELOR OF ARTS

OCTOBER 17, 1959

James Powell Atwood
Marion Eldridge Bradshaw
Horace Hart Carmichael
Ray Willard Conrad
Edgar Alvin Crumb
Ralph Aaron Daniel
B.S. in Agr. 1946, University of
Arkansas

Ga. William Lee Foust
Del. John Lowell Gornall
Va. Jerome Michael Kennedy
Pa. Fred Cornelius Latham
Va. Nicholas Michael Seminoff
Ark.

Kent.
Ohio
Tenn.
Ill.
Calif.

FEBRUARY 22, 1960

William Francis Beatty
Bill Richard Blalock
Melvin Anthony Carle
Bernard M. Engleberg
James Wiley Guy
Paul Ives Hunter
Ivan Howard Johnson
William Walker Lancaster
Richard Paul Lee

N.J. Daniel James McVicar
Ala. Robert Pershing Muir
Ohio Frank Ira Nulton
Md. Carl Leonard Scherrer
Ill. Evelyn Regina Schlosser
Pa. Luther Lois Schwin
Va. Frances Rice Shute
Pa. Lester Jay Zucker
Ga.

N.Y.
Tenn.
N.J.
Wash.
N.D.
Ohio
Mich.
N.Y.

JUNE 1, 1960

Edwin William Abbott III
William Raiford Affleck, Jr.
Graham Carson Beachum
George Allen Brigham
Edward Eginio Camporini
Edward Lee Carpenter

Md. Beulah May Clewlow
S.C. Walter Phillip Cumbie
Va. Samuel Guthrie Davis
Va. Clyde Wilton Elliott
N.J. Hodges Samuel Wilburn Escue
Wash. John Thomas Gaskin

Va.
Fla.
Md.
Va.
Texas
S.C.

Glenn Roy Grimm
Eugene Henry Haffey
Clifford Donald Hall
Elroy E. Harris
Bernard Harold Hunt
Chester Allen Jones
Lucille Ross Kuhn
William Scanlon Mayer
Bernard McShane
Harwood F. Means

Va. Robert Emmett Murphy
Ohio Edward Douglas Oglesby
Wis. Bruce William Platz
Texas Georgia Mae Scott
Wis. Bradford Lee Smith
Md. Carl Hildreth Strandberg
Va. Edward George Troell
N.Y. Herman Abington Walker
Ill. (With distinction)
Okla.

Va.
Ill.
Mich.
Pa.
Ohio
Md.
Va.
Ark.

MASTER OF ARTS

OCTOBER 17, 1959

Claud Ashby Alsop
B.S. 1954, University of Maryland
John Elliott Arthur, Jr.
B.S. 1937, University of Pittsburgh
Daniel Henry Bonham
B.S. in Ed. 1941, Pennsylvania State
Teachers College, Bloomsburg
William Francis Carr
A.B. 1947, Colorado College
Joseph Charles Fimiani
B.S. in Arch. 1948, Rensselaer
Polytechnic Institute

Md. George Gerdes Isenhower
Va. B.B.A. 1938, University of Texas
Michael Pivarnik
Va. A.B. 1958, The George Washington
University
Donald Chapeze Stanton
Ohio B.B.A. 1950, Southern Methodist
University
N.Y.

Texas
Pa.
La.

FEBRUARY 22, 1960

William W. Berg
B.S. 1956, University of Maryland
Robert Dewey Bohn
B.S. 1952, University of San Francisco
Telford Smith Byington
B.S. 1957, University of Southern
California
Raymond Lemuel Cato
B.S. 1936, U. S. Military Academy
Francis Kennedy Coss
B.S. 1941, University of Illinois

Ind. Hugh Leonidas Crandall
Wis. B.S. in Ed. 1938, D.C. Teachers
College
Idaho Robert Charles Hixon
B.S. in Mil.Sc. 1958, University of
Maryland
Ind. Edward Norton Rydallch
B.S. in B.A. 1938, University of
California at Los Angeles
Va. Charles Willard Swan
B.S. 1939, North Carolina State College
of Agriculture and Engineering

D.C.
Va.
Calif.
N.C.

JUNE 1, 1960

Cloyd Lee Arney
B.S. 1949, Tennessee Polytechnic
Institute
LL.B. 1949, Vanderbilt University
Maxmillian Newman Brinkman
B.S. 1937, Catholic University of
America
Arthur Peter Brody
B.C.S. 1939, New York University
Thomas Michael Joseph Crowley
A.B. in Govt. 1957, The George
Washington University
William Edward Donlon, Jr.
B.S. in B.A. 1948, Boston University
Rainold Joe Franek
A.B. 1950, Doane College
Ronald Hoyle Greathouse
A.B. 1956, Agricultural and Mechanical
College of Texas
Ernest Leon Hardt
B.S. 1954, Lewis and Clark College
William Dewey Heier
B.S. 1954, University of Maryland
John William Lauttamus
A.B. 1956, Ohio Wesleyan University

Tenn. Alex Richard Lawrence
B.S. in B.A. 1952, Boston University
Ind. John Lawrence Neff
B.S. 1951, U. S. Naval Academy
D.C. John Calvin Peoples
B.B.A. 1949, Texas College of Mines
and Metallurgy
Va. Frank Harold Sargent
B.S. 1958, University of Maryland
Md. Thomas Havard Sayes
B.S. 1940, Pennsylvania State Teachers
College, East Stroudsburg
Nev. Donald Cameron Tabb
B.S. 1959, University of New Hampshire
Nebr. Forrest Carson Thompson, Sr.
B.S. 1932, U. S. Naval Academy
Texas John Arnold Timour
A.B. 1951, Miami University
Oreg. Marshall A. Webb, Jr.
A.B. 1944, Louisiana Polytechnic
Institute
Fla. Warren Edgar Whipple
A.B. 1941, San Diego State College
Md. Kermit Charles Zieg
B.S. in Ed. 1940, Ohio State University

Va.
Ind.
Pa.
N.Y.
Calif.
Calif.
Va.
Md.
Texas
Calif.
Ohio

THE GRADUATE COUNCIL

DOCTOR OF PHILOSOPHY

FEBRUARY 22, 1960

- | | | | |
|--|------|---|-------|
| Martin Dishart
B.S. 1950, College of the City of New York
Dissertation: "A Study of the Effectiveness of Counseling and Psychological Testing Services for 'Legally Blind' Adults in a Rehabilitation Setting" | D.C. | Minnie Rob Phaup
A.B. 1927, College of William and Mary
A.M. 1930, University of Chicago
A.M. 1956, The George Washington University
Dissertation: "A Study of the Self Concepts of a Group of Women Patients Who, Though Clinically in Remission, Remain in a Mental Hospital" | Va. |
| William Lloyd Fox
A.B. 1943, A.M. 1945, Western Reserve University
Dissertation: "Harvey W. Wiley: The Formative Years" | Md. | Harry Myer Rosenblatt
B.S. 1948, M.S. 1953, The George Washington University
Dissertation: "Multivariate Experimental Designs" | Md. |
| James Edward Hanson
A.B. 1949, Cornell University
A.M. 1951, Harvard University
Dissertation: "On Linear Sequence Spaces which Permit Omission and Adjunction and Have Finite Dimension Modulo Convergence" | Md. | Freddie Orleans Sabghir
B.S. 1944, Cornell University
A.M. 1947, Columbia University
Dissertation: "Relation Between Consistency and Ego-Supportiveness of Influence Techniques Used by Parents and Behavior, and Self-Acceptance of Children" | Mick. |
| Bernard William Janicki
A.B. 1953, A.M. 1955, University of Delaware
Dissertation: "A Study of the <i>in vitro</i> Tuberculin Lysis of Leukocytes from Tuberculin-Hypersensitive Guinea Pigs" | Va. | Archie Lee Smith
B.S. in Phar. 1955, M.S. 1957, The George Washington University
Dissertation: "Cholesterol Uptake by Inverted Intestinal Sacs" | Wa. |
| Herbert Koro Kashiwa
B.S. 1950, University of Hawaii
M.S. 1954, The George Washington University
Dissertation: "Magnesium Deficiency in Intact, Adrenalectomized, and Hypophysectomized Rats" | Ky. | | |

JUNE 1, 1960

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|--|------|--|-----|
| Edward Lewis Hoffman
B.S. 1929, Roanoke College
A.M. 1937, The George Washington University
Dissertation: "The <i>Pastorlas</i> of José Trinidad Reyes: A Critical Study" | Va. | Jiro Oyama
B.S. 1949, Northwestern University
M.S. 1956, The George Washington University
Dissertation: "Studies on the Measurement of Serum Insulin-like Activity Using the Isolated Mouse Diaphragm Tissue" | Md. |
| William Daniel Lawton
A.B. 1950, Brown University
M.S. 1953, University of Maine
Dissertation: "Antigens Associated with Virulence in <i>Pasteurella pestis</i> " | Md. | Calvin Donald Ritchie
B.S. 1954, The George Washington University
Dissertation: "Application of the Concept of Electronegativity to Structure-reactivity Correlations in Organic Chemistry" | Md. |
| Isidore Arthur Michaelson
A.B. 1950, New York University
M.S. 1955, University of Cincinnati
Dissertation: "The Effects of 5-Bromouracil on a Thymine Requiring Mutant of <i>Escherichia coli</i> " | D.C. | Ira Weinstein
B.S. 1949, Roosevelt University
M.S. 1952, University of Illinois
Dissertation: "Pyruvate Oxidation by Strains of Graded Virulence of <i>Pasteurella tularensis</i> " | Md. |

HONORARY DEGREES

OCTOBER 17, 1959

Harold Jefferson Coolidge—*Doctor of Science*

FEBRUARY 22, 1960

David Edward Finley—*Doctor of Laws*

Winfred Overholser—*Doctor of Laws*

JUNE 1, 1960

James Plemon Coleman—*Doctor of Laws*
Fred Korth—*Doctor of Laws*
Jeremiah Milbank—*Doctor of Laws*

Robert Eben Smylie—*Doctor of Laws*
Edward Teller—*Doctor of Science*

RECIPIENTS OF AWARDS

1959-60

SCHOLARSHIPS

- Alpha Zeta Omega Scholarship:* Arlene Lee Downing
Alumni Scholarships: Robert Arthur Aleshire, Nelson Harry Coar, Jr., Stephen Gidding Harris, Harry Brice Qualman, Stanley Ray Remsburg, Daniel Earl Spector, Phillip Allan Taylor
American Foundation for Pharmaceutical Education Scholarships: Conrad Anthony Leongini, Christine Muehlelehner
American Society of Women Accountants Scholarship: Nancy Hanks Keim
Byron Andrews Scholarship: Richard William Engelbart
Association of Federal Communications Consulting Engineers Scholarship: Kitt Earl Gilliland
Anna Bartsch Scholarship: Violet Bowen
Everett Lamont Bradley Scholarship: Allen Mendel Mondzac
Capital Farm and Garden Scholarship: Ethel Christine Wilson
Emma K. Carr Scholarships: Joel Beiser, Richard Clay Brown, Roderick Michael Groves, Eugene Gary Horowitz, Charles Olof Johnson, Henry Casabianca Mayo, Richard Lee Potterton, Vito Tanzi, Stephen Arthur Thau, Constantine Harry Tseronis, Arthur Richard Ugel, Kenneth Wai Yee
Henry Harding Carter Scholarship: Howard Thiebaut Hill
Maria M. Carter Scholarship: Walter Godfrey Santilli
Crown Photo Scholarship: Thomas Victor Fuller
Daughters of the American Revolution Scholarship: Elizabeth Hanahan Oliver
Isaac Davis Scholarship: Nancy Ruth Leppert
District of Columbia Pharmaceutical Association Scholarship: Marcia Clair Keesling
School of Engineering Scholarships: John Carl Alexy, Lawrence Merryman Denison, Donald Lee Eddins, Lee Kaminetsky, Francis Michael Klish, Donald Abram Miller, William Perazich, Thomas Franklin Pollock
Henry Parsons Erwin Scholarship: Paul Albert Oscar
Robert Farnham Scholarship: Nancy Lee Head
General Motors Scholarships: William Henry Blake, John Gordon Day, John Pierce Donley, Richard Sides Lykes, Joyce Judson Ormsby
Georgetown Business and Professional Women's Club Scholarship: Carole Ann Vereka
Grants-in-Aid Scholarships: Joseph Adamitis, Walter Anderson, Nicholas Ralph Anzelmi, Jack Allen Arthur, Robert James Barbiere, Stephen Joseph Bartnicki, Howard Orr Bash, Clifford Botyos, Edgar George Bowers, Leo N. Burnett, Jr., Henry Frederick Busky, Frank Charles Campana, John Robert Caracciolo, Ronald Cindrich, Joseph George Coniglio, Warren Corbin, Miller S. Council, Douglas Crupper, Eugene J. Culnon, Ronald Michael DeMello, Gerald N. DePalma, Lovis DeSimone, William H. Dierks, John Granville Dunn, William Hugh Fearer, Jeffrey Allen Feldman, Jon Alden Feldman, Benson Alexander Finkel, Richard Hale Fischman, Anthony Fredicini, Thomas Hagoood W. Gantt, Desmond Francis Gatti, Francis A. Greenwell, Thomas Harkle-Haly, Joseph David Haney, William Downey Hardy, Alvin Dwayne Herron, road, Joel Roger Hedetniemi, Donald Charles Herman, Michael Roy

- Dennis Wesley Hill, Edward John Hino, Keith T. Holman, Charles William Hornfeck, Richard J. Hornfeck, Richard Leo Hutsko, William Horace Ingram, William C. Keys, Ralph Edward Kunze, David Bourbon Lockman, Richard B. Markowitz, Thomas J. Morosky, Paul J. Munley, Carl Ray Nidiffer, William A. Norton, Richard Ernest Oden, Joseph Edward Ozefovich, Charles Domenick Packan, Charles Leonard Padgett, Jr., Donald Ray Palmer, Joseph John Paluck, William Thomas Pasche, Charles E. Payne, Frank B. Pazzaglia, John Pilconis, Rudy Pohl, Leon T. Pollock, Eugene Posati, Roy Jerome Power, Kenneth Ramsauer-Garrison, Charles Bass Reed, Ronald Kenneth Reeves, Thomas T. Rogers, Stuart P. Ross, Garland Rudder Schweickhardt, Gary Scollick, Mark F. Sherry, Kenneth Jerome Silverstone, Jerry Michael Sluger, William Edward Smythe, Albert Harry Snyder, Alexander Gregory Sokaris, Peter Ruediger Sommer, Elliot Swift, James Kershaw Tarr, James Mauro Tricoli, Lawrence G. Usiken, James Dale Walters, Peter Joseph Wasilewski, William Richard Wells, Herbert Duane Whetstone, John Alton White, James Samuel Whitehead, Harry L. Wickline, John Benjamin Wilt, Ellis Bowman Wisler, Jr., Raymond George Yarashus, Louis H. Yazich, John B. Young, Jr.
- Anna Spicker Hampel Scholarship:* Judith Jaffa Lefkowitz
- Elma Lewis Harvey Scholarship:* Nancy Lee Head
- Hazelton Scholarship:* Rona Lynn Englander
- High School Scholarships:* Sandra Janet Bergman, David William Boldt, Sidney Frederick Bosen, Stephen Clawson Brown, Gisela Anne Caldwell, Bruce Michael Cambos, Carol Christine Carlson, Martin Paul Claussen, Joyce May Davis, Charlotte Katherine Diltz, Joyce Irvine Ellis, Joseph Luther Evans, Irwin Stuart Feldman, Rita Joyce Ferrara, Anne Marie Garfield, Ellen Ruth Garfield, Barbara Ann Habercom, Karen Lee Kesner, Marjorie Ellen Killiam, Robert Leonard Lavine, Michael Thomas Madison, Linda Carol Nusbaum, Edward Jackson Orem, William Guy Carleton Parke, Stephanie Carol Patchen, Girard Hayden Rodgers, Jr., Richard Edwin Shropshire, Elaine Paula Tenenbaum, Elizabeth Howard Wells, Melinda Lee Young
- High School Discussion Conference Scholarships:* Saida Carolyn Newell, Freda Ruth Sussman
- Kappa Alpha Theta Scholarship:* Judith Lee White
- Kappa Psi Scholarship:* Joel Samuel Davis
- Law School Scholarships:* James Peter Gregory, John Monk, Reed L. Moss, Daniel Sachs, Kenneth John Sherk
- Eugene and Agnes E. Meyer Scholarships:* Hans Ragnar Bode, Allen Barry Cohen, Edward Donald Coxen, Ronald Allen Grossman, Alan P. Hawkins, Nancy Hanks Keim, Anne Marie Kirschenbaum, Arlene Marion Krevorkian, Richard Murnick Merelman, Richard Vernon Runge, Thomas Francis Talentino, Joan Frances Walsh, Miriam Judith Wondrack
- A. Morehouse Scholarship:* Henry Justin Ferry
- Newspaper Scholarships:* Calvin Duffey Cramer, William Harold DeLaVergne, Thomas Francis Dimond, Mary Ann Meissner, Robert Francis O'Connor, Jerry Coleman Smiley, James Clinton Threatte
- Panhellenic Association of Washington, D. C., Scholarship:* Sandra Jean Clements
- Paul Pearson Scholarship:* Anna Jirgens
- Phi Delta Gamma Scholarship:* Anita Iff
- Lula M. Shepard Scholarships:* Joan Donell Hyerle, Judith Gail Wheelus
- David Spencer Scholarship:* Joseph Luther Arbena
- Mary Lowell Stone Scholarship:* Cynthia Mason Rhodes
- Charles Clinton Swisher Scholarships:* Sondra Anne Ford, Gerald M. Wetzler
- Texaco Scholarship:* Herbert Swann Wilkinson

University Foreign Service Scholarships: Frederick Augustus Bode, William Thomas Daly, Marilyn Frances Hoffman
 William Walker Scholarship: Henry Justin Ferry
 John Withington Scholarship: Joan Frances Berberich
 Women's Advertising Club of Washington Scholarship: Peggy Conway Smith
 Ellen Woodhull Scholarship: David Louis Dunner
 Zonta Club of Washington, D. C., Scholarship: Evelyn Marie Baumann

PRIZES

1959-60

Alpha Chi Sigma Freshman Awards in Chemistry: William Guy Parke, John Booth Gregory, Irwin Stuart Feldman
 Alpha Chi Sigma Senior Award in Chemistry: Michael William Dix
 Alpha Delta Pi Award in Scholarship and Leadership: Sandra Jean Clements
 Alpha Kappa Psi Award in Commerce: William Henry Blake, Jr.
 Alpha Zeta Omega Award in Pharmacy: Barbara Ann Baker
 American Institute of Chemists Award in Chemistry: Jasper Warner Rothuizen
 Norman B. Ames Memorial Award in Engineering: Richard Myron Beard
 Byrne Thurtell Burns Award in Organic Chemistry: Jasper Warner Rothuizen
 Martin L. Cannon Memorial Award in Pharmacy: Estelle Deborah Luber
 Chi Omega Award in Social Sciences: Joyce Verlaine Anenson
 John Henry Cowles Awards in Government: William Henry Blake, Jr., Richard Murnick Merelman
 DeWitt Clinton Croissant Award for an essay on drama or the theater: Frances Ryan Burdette
 E. K. Cutter Award in English: Mary Nell Gailbreath
 Isaac Davis Awards in Public Speaking: Charles Brand Parker, Jr., Gertrude London, John Andrew Prokop
 Delta Gamma Award for scholarship, extracurricular activities, and service to the University: Linda Carol Nusbaum
 Delta Zeta Award in Zoology: Melinda Lee Young
 Jesse Frederick Essary Award to that student who has given promise of sound citizenship and ability in "forthright reporting": Roger Winship Stuart II
 Joshua Evans III Memorial Award to that man in the graduating class who has demonstrated his signal ability in the social and political sciences and who has given promise of the interpretation of that ability in good citizenship among his fellows: Timothy Dean Mead
 Willie E. Fitch Memorial Award in Chemistry: Jasper Warner Rothuizen
 Allie S. Freed Award to that member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Preventive Medicine: Carl Vernon Yutzy
 Charles Glover Award to that student in the Law School who has attained the highest average grade in the third-year, full-time course: Irving Salem
 Alice Douglas Goddard Award in American Literature: Vernon Kenneth Sandlin
 Edward Carrington Goddard Award in French: Dorothy Katherine Marshall
 James Douglas Goddard Award in Pharmacy: Ronald Lee Block
 Morgan Richardson Goddard Award in Commerce: William Henry Blake, Jr.
 Hamilton Watch Award in Engineering: Leon Henry Sibul
 Alec Horwitz Award to the senior in the School of Medicine who has demonstrated exceptional proficiency in the field of surgery: Julius Morton Goodman, Ronald Edgar Gunther
 Kappa Beta Pi Award to the woman law student in the freshman class who attains the highest average for the freshman year: Janet Goldrich Kohn (1958-59)

Kappa Kappa Gamma Award in Botany: Robert Lee Haney
 John Bell Lerner Award to that member of the graduating class of the Law School with the highest scholastic standing: Patricia Roberts Harris
 Huron W. Lawson Award in Obstetrics and Gynecology: Robert Wendell Cantrell
 Martin Mahler Award in Materials Testing: Stephen Edward Reymers
 Mortar Board Award to the woman student in the Sophomore Class having a scholastic standing of B or higher and the most outstanding record in activities: Joyce Judson Ormsby
 Julius S. Neviasser Award in Orthopedic Surgery: William Hart Sheffield
 Omicron Delta Kappa Award to that member of the Senior Class who, throughout his course, has done the most constructive work in student activities: Timothy Dean Mead
 John Ordranax Awards to the first- and second-year full-time students in the Law School who have attained the highest average grades: Janet Goldrich Kohn, Patricia Roberts Harris (1958-59)
 John Ordranax Award to that member of the graduating class of the School of Medicine with the highest scholastic standing: Julius Morton Goodman
 Phi Delta Kappa Award in Teacher Education: Charles Olof Johnson
 Phi Eta Sigma Award to the beginning male student attaining the highest scholastic average in his first full semester of work: Robert Leonard Lavine
 Pi Beta Phi Award to that member of the Senior Class who, throughout her course, has done the most to promote student activities: Letitia Katz
 Pi Lambda Theta Award in Teacher Education: Irene Wolfe Kimelblatt
 Psi Chi Awards in Psychology: Loring William McAllister, John Smith Thach, Jr.
 Ruggles Award in Mathematics: Ross Edgar Tomlinson
 Sigma Kappa Award in Chemistry: William Guy Parke
 James MacBride Sterrett, Jr., Award in Physics: Hazel Cartwright Moore
 Washington Personnel Association Award for attainment in the field of Business Administration: Thomas James Kerr
 Alexander Wilbourne Weddell Award for an essay on World Peace: Cecil Beam Jones, Jr.
 Zeta Tau Alpha Award in Sociology: Katharine Virginia Rice Smith Collier

STUDENT ASSISTANTS

JUNE 1, 1959 TO JUNE 1, 1960

Accounting: Chris Balodemas, Charles Robert Eskew, Michael Graham Gallagher, Joe David Haney, Nancy Keim, Robert Dean Miller, Robert Earl Nordstrom, Stanley Orlinsky, Albert Snyder
 Art: Martin Paul Amt, Lois Limbert
 Biology: John Walter Carney, Jr., Richard Theodore Chittick, Evangelos Dami-
 anos Karandreas (A.B.) Nena Nettie Riegger
 Botany: Elizabeth Corrine Bailey, Virginia Dryden, Michael Bart Spevak
 Business Administration: Carol Harvey, James Kenneth Palmer
 Chemistry: Laurance Mathews Bryson, John David Clough, Gerald Landau,
 Jasper Warner Rothuizen
 Civil Engineering: Carole Fentress, James Wallace Joyce, Jr., Thomas Edward Miller (fall semester)
 Dramatic Activities: Joan Margaret Howarth, Sharon Mobley
 Economics: Judith Ellen Crumlish, Alan Jason Goldstein, Judith Rose Irwin,
 Frank Lynford Lewis, Thomas Hale Pendleton (A.B., B.S.)
 Education: Elaine Bonnie Beckman, George Kay Goldsmith, David Iwamoto
 (A.M. in Ed.), Susan Ryder, Henry Edward York (A.M. in Ed.)

Electrical Engineering: James David George, Alexander Graps, Jr., Judy Holberg, Robert Howard Houston, Patricia Clare Kerman, Richard Lee Potterton, Sheila Schlossenberg, Allan Ray Tarleton, George Titcomb, Nikolai Tschurain

Engineering Administration: Carole Fentress (fall semester), Linda Silverberg, Linda Williams

English: Judith Jaffe Lefkowitz, Eileen Mary Scott, Jill Zell

Geography: Eldon Stiles Miller, Jr., Mary Ellen Quayle

Geology: Paul Frederick Clarke, John Duncan Gassaway (B.S.), John Eric Lindskold (B.S.), Robert McLean Turner

History: Elena Talcott Constantinople (A.B.), Rachael MacIntyre Dach (A.M.), John Henry Geerken, Margaret Mary McHale (A.B.), Virginia Cardwell Purdy (A.B.), Douglas Kellogg Wood

Law: Patricia Roberts Harris (A.B.), Alan David Hutchison (B.S. in B.A.), Stanley Melvin Lipnik (A.B.), Dennis Olsen (B.S.)

Mathematics: Brenda Sue Friedenberg, Quentin Daryl Hyatt

Mechanical Engineering: George Koo Lea, Thomas Edward Miller (spring semester), Deane Emerson Parker

Pharmacy: Carl Frederick Austerlitz, Milton Ellis Stewart

Philosophy: James Edward Roper

Physical Education for Men: Raymond Black, John Pierce Donley II, Alvin Dwayne Harkleroad, Dennis Wesley Hill, Burton Kaplan, Patricia Martin, Daniel Solt

Physics: Nancy Lucille Benack, Hans Ragnar Bode, Rita Carol Hoffman, Norayr Khatcheressian, Hedy Wertheim

Political Science: Ruth Gots, Stanley David Heckman, Barbara Knight (A.B.), Charles Raeburne Landon, Jr., Timothy Dean Mead, Richard Merelman, Harry Paul Stumpf (A.M. in Govt.), John Vance Witherspoon (A.B.)

Psychology: Arsen Aylaian, George Beach, John Albert Brun, Virginia Smith Cronin (A.B.), Gerald Harris Goldberg (A.B.), Geraldine Agnes Graham (A.B.), Letitia Katz, Nancy Kinsman, Nancy Ruth Leppert, Jean Ballard McInnis, Arthur Schnoll Pomerantz, Jean Serber, Sheldon Slavin, Leslie Elinor Stevenson, Byron LeRoy Witt (A.B.)

Religion: Nancy Lee Head

Romance Languages: Jeanette Croteau, Dorothy Katherine Marshall, Jacqueline Segal, Helene Lynne Strauss, William Talentino

Secretarial Studies: Evelyn Marie Baumann, Anna Warfield Decker

Sociology and Anthropology: Joanne Elsie Holler, Kathryn Theresa Louka (A.B.), Rosina Orr

Speech: Holande Fleurette Boucher, Stuart Harold Gelber, Karlota Marie Koester, Janice Louise Larkins

Statistics: John Franklin Bernheisel, Karen Louise Dreier, Mary Jacqueline Gleason (A.M.), Susan Kinnemann, Mary Alethia Mayes, David Michael Moss, Allen Milton Singer (A.B.), Thomas Clair Varley

Zoology: Maria Elisabeth Bode, Robert David Buono (B.S.), Edward Bernard Byrd, John David Clough (fall semester), Craig Brian Davis, Anne Juliet Gibert (A.B.), Martin Bernard Kass, Richard Emil Linde, George Ivan Malinin (B.S.), Milton Michaelis, William Angus Muir, Mary Kay Patterson, Steven Carl Sandler, Leonard Wartofsky (B.S.), George Wilner

SUMMARY OF REGISTRATION

1959-60

JUNIOR COLLEGE

	<i>Men</i>	<i>Women</i>	<i>Total</i>
Freshmen	397	404	801
Sophomores	620	520	1,140
Total	1,017	924	1,941

COLUMBIAN COLLEGE

Juniors	151	172	323
Seniors	256	258	514
Master of Arts candidates.....	260	153	413
Master of Science candidates.....	122	26	148
Unclassified	25	22	47
Total	814	631	1,445

THE GRADUATE COUNCIL

Doctor of Philosophy candidates.....	164	24	188
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THE SCHOOL OF MEDICINE

First Year	97	5	102
Second Year	90	6	96
Third Year	90	6	96
Fourth Year	90	8	98
Total	367	25	392

THE LAW SCHOOL

First Year	496	25	521
Second Year	362	20	382
Third Year	287	20	307
Master of Laws candidates.....	30	1	31
Master of Comparative Law candidates.....	8	1	9
Master of Comparative Law (American Practice) candidates.....	3	1	4
Doctor of Juridical Science candidates.....	9	—	9
Unclassified	25	2	27
Total	1,220	70	1,290

THE SCHOOL OF ENGINEERING

	<i>Men</i>	<i>Women</i>	<i>Total</i>
Freshmen	167	4	171
Sophomores	146	3	149
Juniors	151	2	153
Seniors	145	—	145
Master of Science in Engineering candidates..	172	—	172
Master of Engineering Administration candidates	491	—	491
Doctor of Science candidates.....	3	—	3
Unclassified	40	1	41
Total	1,315	10	1,325

THE SCHOOL OF PHARMACY

	<i>Men</i>	<i>Women</i>	<i>Total</i>
Juniors	21	2	23
Seniors	20	1	21
Total	41	3	44

THE SCHOOL OF EDUCATION

	<i>Men</i>	<i>Women</i>	<i>Total</i>
Juniors	19	72	91
Seniors	48	159	207
Master of Arts in Education candidates.....	258	358	616
Advanced Professional Certificate candidates..	22	32	54
Doctor of Education candidates.....	64	18	82
Unclassified	39	75	114
Total	450	714	1,164

THE SCHOOL OF GOVERNMENT

	<i>Men</i>	<i>Women</i>	<i>Total</i>
Juniors	110	27	137
Seniors	158	32	190
Master of Arts in Government candidates....	165	30	195
Master of Arts in Personnel Administration candidates	42	6	48
Master of Arts in Public Administration candidates	88	1	89
Master of Business Administration candidates	86	7	93
Doctor of Business Administration candidates	38	1	39
Unclassified	25	4	29
Total	712	108	820

THE COLLEGE OF GENERAL STUDIES

	Men	Women	Total
Associate in Arts candidates.....	32	8	40
Bachelor of Arts candidates.....	71	4	75
Bachelor of Science in Cartography candidates.....	10	—	10
Master of Arts candidates.....	23	1	24
Unclassified	1	2	3
Total	137	15	152

THE DIVISION OF UNIVERSITY STUDENTS

University students	1,981	1,665	3,646
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THE DIVISION OF SPECIAL STUDENTS

Special students	591	174	765
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SUMMARY

Students registered, Academic Year 1959-60..	13,553	5,795	19,348
Students registered, Summer Sessions 1959....	2,627	1,501	4,128
Total registrations 1959-60.....	16,180	7,296	23,476
Duplicate registrations	7,228	3,076	10,304
Total number of students registered 1959-60*	8,952	4,220	13,172
* The above number does not include:			
The College of General Studies (Off Campus)			
Credit courses			5,536
Noncredit courses			576
Television noncredit courses.....			4,718
Total			10,830

TEACHING STAFF 1959-60

Professors Emeritus	45
Professors	116
Research Professors	3
Adjunct Professors	2
Professorial Lecturers	79
Clinical Professors	21
Associate Professors	72
Associate Clinical Professors.....	24
Associate Research Professor.....	1
Associate Professorial Lecturers.....	34
Associates in the School of Medicine.....	128
Assistant Professors	70
Assistant Clinical Professors.....	83

Assistant Research Professors.....	4
Lecturers	127
Instructors	15
Clinical Instructors	171
Associates	63
Fellows in the School of Medicine.....	32
University Teaching Fellows.....	19
Graduate Teaching Assistants.....	20
Technicians	16

TOTAL.....

1,145

DEGREES CONFERRED

1959-60

Advanced Professional Certificate (Education).....	3
Associate in Arts (College of General Studies).....	42
Associate in Arts (Junior College).....	470
Bachelor of Arts (College of General Studies).....	58
Bachelor of Arts (Columbian College).....	252
Bachelor of Arts in Education.....	81
Bachelor of Arts in Government.....	108
Bachelor of Civil Engineering.....	9
Bachelor of Electrical Engineering.....	29
Bachelor of Laws.....	186
Bachelor of Mechanical Engineering.....	20
Bachelor of Science.....	30
Bachelor of Science in Engineering.....	5
Bachelor of Science in Home Economics.....	3
Bachelor of Science in Pharmacy.....	20
Bachelor of Science in Physical Education.....	20
Doctor of Business Administration.....	1
Doctor of Education.....	3
Doctor of Medicine.....	97
Doctor of Philosophy.....	15
Juris Doctor	40
Master of Arts (College of General Studies).....	38
Master of Arts (Columbian College).....	51
Master of Arts in Education.....	119
Master of Arts in Government.....	24
Master of Arts in Personnel Administration.....	8
Master of Arts in Public Administration.....	21
Master of Business Administration.....	63
Master of Comparative Law.....	5
Master of Comparative Law (American Practice).....	1
Master of Engineering Administration.....	48
Master of Laws.....	19
Master of Science.....	13
Master of Science in Engineering.....	13

TOTAL.....

1,915

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

UNITED STATES, TERRITORIES, AND POSSESSIONS

Alabama	21	Nebraska	29
Alaska	3	Nevada	12
Arizona	17	New Hampshire	17
Arkansas	23	New Jersey	200
California	144	New Mexico	24
Colorado	22	New York	376
Connecticut	77	North Carolina	83
Delaware	35	North Dakota	10
District of Columbia	3,958	Ohio	115
Florida	101	Oklahoma	29
Georgia	41	Oregon	28
Hawaii	20	Pennsylvania	387
Idaho	25	Rhode Island	25
Illinois	124	South Carolina	30
Indiana	64	South Dakota	14
Iowa	37	Tennessee	45
Kansas	31	Texas	76
Kentucky	30	Utah	29
Louisiana	17	Vermont	9
Maine	28	Virginia	3,516
Maryland	2,440	Washington	38
Massachusetts	102	West Virginia	95
Michigan	77	Wisconsin	50
Minnesota	38	Wyoming	8
Mississippi	19	Canal Zone	3
Missouri	42	Guam	1
Montana	12	Puerto Rico	15

FOREIGN COUNTRIES

Argentina	8	Greece	8
Bolivia	3	Honduras	1
Brazil	12	Hong Kong	1
Burma	3	Hungary	2
Canada	12	Iceland	1
Chile	1	India	27
China	10	Indonesia	12
Colombia	4	Iran	22
Costa Rica	1	Iraq	9
Cyprus	2	Ireland	2
Denmark	1	Israel	5
Ecuador	4	Italy	4
El Salvador	3	Jamaica	3
England	2	Japan	13
Ethiopia	5	Jordan	4
France	4	Korea	31
Germany	1	Lebanon	2
Ghana		Liberia	1

Libya	2	Scotland	3
Malaya	1	Singapore	1
Mexico	5	Soviet Union	2
Morocco	4	Spain	1
Netherlands	3	Sudan	2
Netherlands West Indies....	1	Sweden	2
New Zealand	1	Syria	16
Nicaragua	5	Thailand	1
Nigeria	1	Trinidad	6
Norway	1	Turkey	1
Pakistan	3	Uganda	10
Palau Island	1	United Arab Republic....	8
Panama	3	Venezuela	19
Peru	6	Vietnam	1
Philippines	18	Yemen	3
Poland	1	Yugoslavia	
Romania	1		

ALUMNI AND ALLIED ASSOCIATIONS

THE GENERAL ALUMNI ASSOCIATION

The objectives of this Association are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University

Eligible members are those who have matriculated in any school of the University and who have left the University in good standing, or any person who is or has been a member of the teaching, research, or administrative staff of the University, or of the Board of Trustees of the University. Active members are those eligible members who are current contributors to or life members of The George Washington University General Alumni Association, the Alumni Associations of any school of the University, or contributors to the Alumni Fund.

The Alumni Office is in Bacon Hall, 2000 H Street NW., Washington 6, D. C.

All alumni are urged to keep the Alumni Office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

1960-61

GOVERNING BOARD

President.—James C. Van Story, Jr., A.B. 1948, A.M. 1949; 1612 K Street NW., Washington, D. C.

Vice Presidents:

Columbian College.—Washington I. Cleveland, LL.B. 1923, A.B. 1926; 1712 G Street NW., Washington, D. C.

Graduate Council.—Helen M. Dyer, M.D. 1929, Ph.D. 1935; 3024 Tilden Street NW., Washington, D. C.

School of Medicine.—Frederick Y. Donn, M.D. 1941; 1835 I Street NW., Washington, D. C.

Law School.—L. Jackson Embrey, A.B. 1937, LL.B., LL.M. 1949; 647 22d Street S., Arlington, Va.

School of Engineering.—James C. Crenca, B.E.E. 1955; 9101 Flower Avenue, Silver Spring, Md.

School of Pharmacy.—John J. D. Iglehart, B.S. in Phar. 1954; 3130 Wisconsin Avenue NW., Washington, D. C.

School of Education.—Elsie E. Green, A.B. 1914, A.M. 1928; 3151 Tennyson Street NW., Washington, D. C.

School of Government.—Thaddeus A. Lindner, A.B. in Govt. 1951; 5524 30th Place NW., Washington, D. C.

College of General Studies.—J. Frank Doubleday, A.M. 1955; 404 N. Kenmore Street, Arlington, Va.

Treasurer.—James F. Perrin, LL.B. 1937; 3027 Chestnut Street NW., Washington, D. C.

Executive Secretary.—Mary Dow, A.B. 1953; 304 Green Street, Alexandria, Va.

THE GEORGE WASHINGTON UNIVERSITY MEDICAL ALUMNI ASSOCIATION

The George Washington University Medical Alumni Association, the organization of graduates of the School of Medicine, was established in 1905 and since 1926 has been affiliated with the General Alumni Association. The objects of the Association, as stated in the constitution, are "The promotion of the science and art of medicine and the welfare of the School of Medicine."

1959-60

President.—Frederick Y. Donn, M.D. 1941; 1835 I Street NW., Washington, D. C.

President Elect.—Edward E. Ferguson, M.D. 1936; 1835 I Street NW., Washington, D. C.

First Vice President.—Frederick A. Reuter, M.D. 1916; 1835 I Street NW., Washington, D. C.

Second Vice President.—Austin B. Rohrbaugh, Jr., M.D. 1941; 4422 East West Highway, Bethesda, Md.

Secretary.—Marcus P. Goumas, A.B. 1938, M.D. 1948; 1801 I Street NW., Washington, D. C.

Treasurer.—Naomi M. Kanof, A.B. 1931, M.D. 1934; 1150 Connecticut Avenue NW., Washington, D. C.

Council:

Richard H. Fischer, B.S. 1939, M.D. 1943; 1801 I Street NW., Washington, D. C.

Donald H. Leeper, Jr., M.D. 1938; 1835 I Street NW., Washington, D. C.

George D. Speck, M.D. 1941; 2772 S. Randolph Street, Arlington, Va.

Alfred E. Brigulio, M.D. 1936; 2025 I Street NW., Washington, D. C.

J. Roscoe Creer, M.D. 1935; 900 17th Street NW., Washington, D. C.

THE GEORGE WASHINGTON LAW ASSOCIATION

The George Washington Law Association, the organization of graduates of the Law School, was founded in 1912 and has been affiliated with the General Alumni Association since 1926. Its purposes as stated

in the constitution are to promote high standards of legal education, to keep the alumni of the Law School in closer touch with one another and especially with members of their own classes, to gather and publish at intervals information as to the whereabouts and activities of these alumni, and to further the interests of the Law School.

1959-60

- President*.—Fontaine C. Bradley, LL.B. 1925; 1820 45th Street NW., Washington, D. C.
- First Vice President*.—Sam Houston, LL.B. 1936 (National University); 725 13th Street NW., Washington, D. C.
- Second Vice President*.—Philbrick McCoy, LL.B. 1922, LL.M. 1923; The Superior Court, Los Angeles, Calif.
- Third Vice President*.—George E. Monk, A.B. 1928, LL.B. 1930, LL.M. 1934; 4020 Franklin Street, Kensington, Md.
- Secretary*.—Edwin S. Nail, LL.B. 1951; 816 Connecticut Avenue NW., Washington, D. C.
- Treasurer*.—Samuel J. L'Hommedieu, Jr., LL.B. 1951, LL.M. 1952; 729 15th Street NW., Washington, D. C.
- Executive Committee*:
- W. Cameron Burton, LL.B. 1921; Investment Building, Washington, D. C.
- Arthur C. Clephane, LL.B. 1936 (National University); 123 Broad Street, Philadelphia, Pa.
- A. Sherman Christenson, LL.B. 1931 (National University); Federal Building, Salt Lake City, Utah
- Charles Russell Cutler, J.D. 1949; World Center Building, Washington, D. C.
- Gordon W. Daisley, LL.B. 1933; 700 10th Street NW., Washington, D. C.
- Margaret H. Earley, LL.B. 1934; 812 Barr Building, Washington, D. C.
- L. Jackson Embrey, LL.B., LL.M. 1949; 1437 N. Courthouse Road, Arlington, Va.
- Elizabeth S. Freret, LL.B. 1950; 202 World Center Building, Washington, D. C.
- Robert S. Hope, A.B. 1950, J.D. 1951; Tower Building, Washington, D. C.
- Joseph D. Hughes, LL.B. 1934; 525 William Penn Place, Pittsburgh, Pa.
- Thomas S. Jackson, A.B. 1933, LL.B. 1935; 719 15th Street NW., Washington, D. C.
- Arthur Logan, A.B. 1925, LL.B. 1926; Continental American Building, Wilmington, Del.

L. Karlton Mosteller, LL.B. 1924 (National University); 2712 First National Building, Oklahoma City, Okla.

Clair L. Stout, LL.B. 1938; Munsey Building, Washington, D. C.

James F. Perrin, LL.B. 1937 (National University); 3027 Chestnut Street NW., Washington, D.C.

THE LIBRARY SCIENCE ALUMNI ASSOCIATION

The Library Science Alumni Association was organized in 1932 by graduates of the Division of Library Science and became an affiliate of the General Alumni Association in 1935. It was established to foster a closer relationship between the Faculty and graduates and to further the interests of the Division of Library Science and of the University as a whole.

1959-60

President.—Elinor Elizabeth Dunnigan, A.B. 1930, A.M. 1932; 5205 Colorado Avenue NW., Washington, D. C.

Vice President.—Mary Louise Beitzell; 1415 Tuckerman Street NW., Washington, D. C.

Secretary.—Helen Christina Sunday, A.B. 1935; 3900 Cathedral Avenue NW., Washington, D. C.

Treasurer.—Helene Marie Gingras, A.B. 1932; 316 North Carolina Avenue SE., Washington, D. C.

THE GEORGE WASHINGTON UNIVERSITY ENGINEER ALUMNI ASSOCIATION

The Engineer Alumni Association was organized in 1936 and has been affiliated with the General Alumni Association since that time. Its objects are to unite the graduates and Faculty of the School of Engineering in closer fellowship, to promote the general welfare of the School of Engineering and of the University at large, to foster activities of the engineering organizations recognized by the University, and to advance the profession of engineering in general.

1959-60

President.—James J. Crenca, B.E.E. 1955; 1901 Flower Avenue, Silver Spring, Md.

Vice President.—Anthony T. Lane, B.E.E. 1957; 4014 Treetop Lane, Alexandria, Va.

Secretary.—Paul Kuzio, B.C.E. 1955; 3601 Van Ness Street NW., Washington, D. C.

Treasurer.—Thomas Creswell, B.S. in Eng. 1956; 2701 Philbun Drive, Adelphi, Md.

Executive Committee:

- Herbert H. Rosen, B.S. in Eng. 1954; 3725 Macomb Street NW., Washington, D. C.
 Alfred B. Moe, A.B. 1949, B.C.E. 1953; 130 S. Columbus Street, Arlington, Va.
 Frank T. Mitchell, Jr., B.E.E. 1940; 5520 Uppingham Street, Chevy Chase, Md.
 Benjamin C. Cruickshanks, B.M.E. 1920; 5733 4th Street NW., Washington, D. C.
 James M. Brearley, B.S. in Eng. 1941; 1452 Juniper Street NW., Washington, D. C.
 Leon Tepper, B.S. in Eng. 1941; 3018 Cambridge Place NW., Washington, D.C.
 George F. Titrington, Jr., B.C.E. 1950; 4111 Rosemary Street, Chevy Chase, Md.

THE GEORGE WASHINGTON UNIVERSITY NURSES ASSOCIATION

The George Washington University Nurses Association was organized in 1914. In 1936 this organization was made an integral part of the General Alumni Association, and graduates of the School of Nursing were accorded associate membership. In 1954 graduates became eligible to full membership. The objects of the Association are to hold in unison the graduates of the George Washington University Hospital School for Nurses, to care for its sick members and to promote the advance of nursing in the interest of the George Washington University Hospital.

1959-60

- President.*—Flora Schroebl; 1830 17th Street NW., Washington, D. C.
Vice President.—Ruby Gottwals; 2129 19th Street NW., Arlington, Va.
Secretary.—Laura Sanders; 2707 Adams Mill Road NW., Washington, D. C.
Treasurer.—Alma W. Binks; 4821 16th Street NE., Washington, D. C.

WOMEN'S PHYSICAL EDUCATION ALUMNAE ASSOCIATION

The purpose of this organization is to foster and promote the teaching profession in the fields of Health, Physical Education, and Recreation. Its functions are (1) to attract students to the profession who show evidence of outstanding teaching capability, (2) to offer professional guidance to members in this field of work, (3) to render service to the community, (4) to render service to the University.

1959-60

President.—Jane S. Bernot, B.S. in P.E. 1945; 1365 Hamilton Street NW., Washington, D. C.

Secretary.—Beverlie G. Latimer, B.S. in P.E. 1958; 315 Franklin Street NE., Washington, D. C.

Treasurer.—Eleanor Baudino, B.S. in P.E. 1955; 4211 Oakridge Lane, Chevy Chase, Md.

REGIONAL ALUMNI CLUBS

Regional alumni clubs sponsored by the General Alumni Association are maintained in the following places: Los Angeles, Calif.; Miami, Fla.; Atlanta, Ga.; Chicago, Ill.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; Kansas City, Mo.; Brooklyn, N. Y.; New York City, N. Y.; Cleveland, Ohio; Tulsa, Okla.; Philadelphia, Pa.; Pittsburgh, Pa.; Dallas, Texas; Seattle, Wash.; Milwaukee, Wis.; Arkansas; Northern California; New Jersey; Ohio River Valley; Utah; Hawaii; Philippine Islands; Puerto Rico.

Information about the officers and activities of these clubs may be obtained from the Alumni Office of the University.

THE LETTERMEN CLUB

The membership of this organization shall consist of those men who, for participation in a sport at The George Washington University, have been awarded varsity letters or freshmen numerals, who are no longer undergraduate students of the University; and those men who, for managing a freshman or varsity sport, received letters or numerals.

The objectives of the club are (1) to bring together on a social level former lettermen of all sports, (2) renew acquaintances and to promote fellowship, (3) encourage higher ideals of intercollegiate athletics at the University, and (4) to assist the University in matters pertaining to athletics when requested.

1959-60

President.—Harold M. Kiesel, A.B. in Govt. 1937; 10116 Ashwood Drive, Kensington, Md.

Vice President.—Howard Tihila, B.S. 1938; 5100 Wehawken Road, Washington, D. C.

Secretary.—Vincent J. DeAngelis, B.S. in P.E. 1939, A.M. in Ed. 1948; 3680 N. Peary Street, Arlington, Va.

Treasurer.—Ellis Hall, A.B. in Ed. 1943; 4810 33d Street N., Arlington, Va.

THE GRADUATE ENDOWMENT FUND

The Graduate Endowment Fund was founded by the class of 1926 with the object of providing endowment to be used for the development of the University. Membership is limited to seniors and graduates who sign a pledge of \$100, payable annually in ten equal installments.

The pledge notes and funds are held in trust. When the principal reaches the sum of \$100,000, the Board of Administrators of the Fund may pay the University such sums as it may vote for the erection of buildings, acquisition of sites, maintenance, and purchase of equipment. At no time may money be drawn so as to leave a balance of less than \$50,000 on deposit.

THE COLUMBIAN WOMEN

The objectives of this organization are (1) the promotion of acquaintanceship among its members, (2) the advancement of women by the founding of scholarships in the various departments of the University, and (3) the promotion of the interests of the University.

MEMBERSHIP

The following persons shall be eligible for active membership: (a) any woman who is currently registered or has been previously registered as a student in The George Washington University; (b) any woman member of the Faculties or Board of Trustees, any woman on the administrative staff; the wife of any member of the Faculties, Board of Trustees, or of the administrative staff; (c) any woman recipient of an honorary degree from the University.

1960-61

President.—Dora M. Ihle, A.B. 1935, A.M. 1936; 2465 Virginia Avenue NW., Washington, D. C.

First Vice President.—Margaret Davis, A.B. 1937, A.M. 1941; 1657 31st Street, NW., Washington, D. C.

Second Vice President.—Mary C. Van Story, A.B. 1949; 3427 Porter Street NW., Washington, D. C.

Treasurer.—Elma Williams, A.B. 1954; 2032 Belmont Road NW., Washington, D. C.

Assistant Treasurer.—Winifred Cox, A.B. 1940, A.M. in Ed. 1947; 2013 New Hampshire Avenue NW., Washington, D. C.

Corresponding Secretary.—Nan B. Word, A.B. 1958; 1303 S. Barton Street, Arlington, Va.

- Assistant Corresponding Secretary.*—Ruth E. Nicalo, A.B. 1951; 6008 Berkshire Drive, Bethesda, Md.
Recording Secretary.—Dorothy D. Glenn, A.B. 1958; 3937 N. Chesterbrook Road, Arlington, Va.
Historian.—Helen S. Stone, A.M. 1949, Ph.D. 1954; 2124 I Street NW., Washington, D. C.
General Counsel.—Mary M. Connelly, LL.B. 1922; 1830 17th Street NW., Washington, D. C.

THE WOMEN'S BOARD OF THE GEORGE WASHINGTON
UNIVERSITY HOSPITAL

The object of this organization is to aid in every way the interests and advancement of The George Washington University Hospital. Meetings are held on the first Wednesday of each month, October to June, inclusive.

1960-61

- President.*—Mrs. John Parks
First Vice President.—Mrs. Barton W. Richwine
Second Vice President.—Mrs. Henry W. Herzog
Third Vice President.—Mrs. A. Burks Summers
Recording Secretary.—Mrs. Carl Walther
Corresponding Secretary.—Mrs. Hulbert T. Bisselle
Assistant Corresponding Secretary.—Mrs. Paul Calabrisi
Treasurer.—Mrs. Wolfram K. Legner
Assistant Treasurer.—Mrs. Paul W. Bowman
Members at Large:
 Mrs. Walter A. Bloedorn
 Mrs. Robert W. Bolwell
 Mrs. Cloyd H. Marvin
 Mrs. Joseph H. Roe

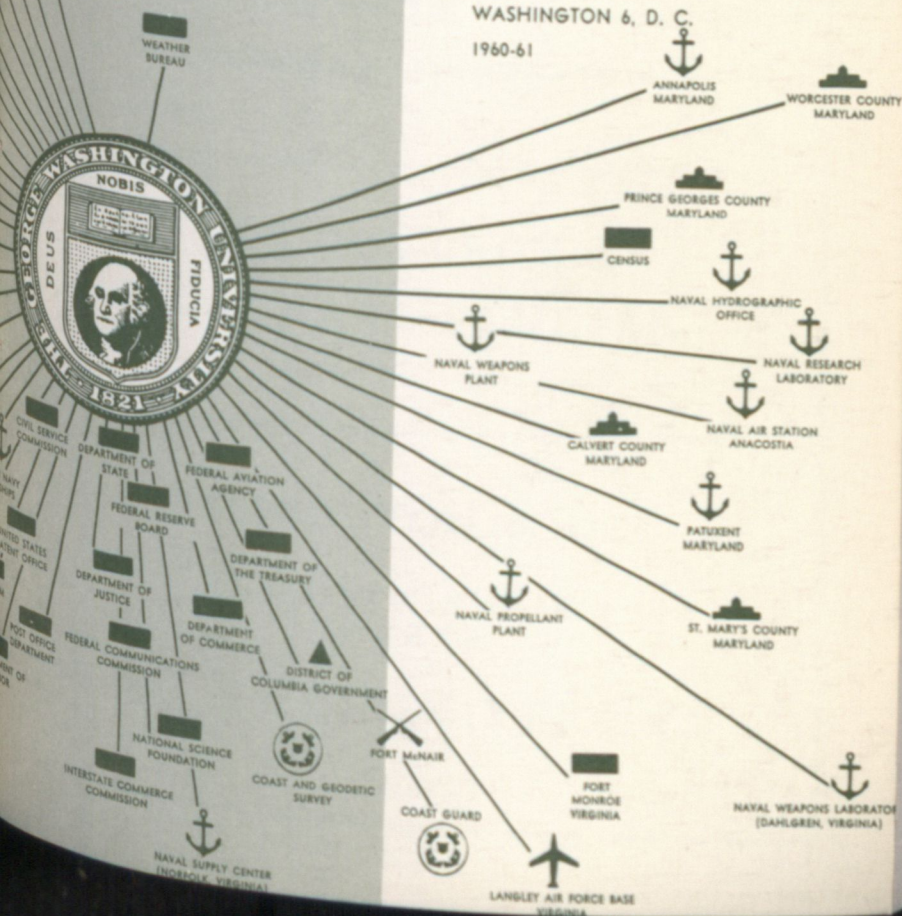
The George Washington University

Bulletin

The College of General Studies

WASHINGTON 6, D. C.

1960-61



PUBLISHED BY THE UNIVERSITY
AT WASHINGTON, D. C.
JANUARY, FEBRUARY, APRIL, JUNE, JULY, AUGUST, OCTOBER, NOVEMBER, AND DECEMBER

SECOND CLASS POSTAGE PAID AT WASHINGTON, D. C.

THE
GEORGE
WASHINGTON
UNIVERSITY
BULLETIN

VOL. LIX

No. 9

THE COLLEGE OF
GENERAL STUDIES

WASHINGTON 6, D. C.

PUBLISHED IN AUGUST
MCMLX

BY THE UNIVERSITY

1960													1961																									
July													January													July												
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COLLEGE OF GENERAL STUDIES CALENDAR*

Date	Day	Occasion
1960		
FALL SEMESTER:		
Sept. 6-16	Tues.-Fri.	Advising for all entering Junior college students
*Sept. 1-Oct. 28.	Thurs.-Fri.	Period for Off-Campus registration† and beginning of classes
Sept. 15	Thurs.	Orientation Assembly for all new On-Campus students
Sept. 20	Tues.	Placement tests for On-Campus students
Sept. 22-24‡ . .	Thurs.-Sat.	Registration on Campus‡
Sept. 26	Mon.	Classes begin on Campus
Sept. 30	Fri.	CGS meeting of Staff of Instruction, Monroe 102, 8:30 P.M.
Oct. 7	Fri.	Last day for filing in the Office of the Dean thesis subjects for Master's degrees to be conferred in February
Oct. 22	Sat.	Fall Convocation
Oct. 31	Mon.	Last day for applying in the Registrar's Office for February graduation
Nov. 11	Fri.	Veterans Day holiday
Nov. 24-26 . . .	Thurs.-Sat.	Thanksgiving recess
Dec. 1 and 2 . . .	Fri. and Sat.	Comprehensive examinations for Master of Arts candidates
Dec. 10	Sat.	Graduate Record Examination
Dec. 22-Jan. 2.	Mon.-Sat.	Christmas recess for On-Campus and Off-Campus students
1961		
*Jan. 2-Feb. 10.	Mon.-Fri.	Period for Off-Campus registration‡ and beginning of classes
Jan. 3	Tues.	On-Campus classes resume
Jan. 18	Wed.	Last day for submitting to the Dean theses of February Master's candidates
Jan. 20	Fri.	Last day of Campus classes for the fall semester
Jan. 23-31 . . .	Mon.-Tues.	Inauguration Day holiday
Jan. 28	Sat.	On-Campus examination period
		CGS meeting of Staff of Instruction, Monroe 102, 10:30 A.M.

* Courses in the College of General Studies may be organized upon request at any time during the year.
† Application for degree, for Graduate Record Examinations, and for comprehensive examinations is the responsibility of the student and must be made at the time of registration for the last classes required for the degree concerned.
‡ Saturday registration is from 9:00 A.M. to 1:00 P.M.

COLLEGE OF GENERAL STUDIES CALENDAR (Continued)

Date	Day	Occasion
SPRING SEMESTER:		
‡Feb. 2-4	Thurs.-Sat.	Registration on campus†
Feb. 6	Mon.	Classes begin on campus
Feb. 10	Fri.	Last day for filing in the Office of the Dean thesis subjects for Master's degrees to be conferred in June
Feb. 22	Wed.	Winter Convocation holiday
Feb. 28	Tues.	Last day for applying in the Registrar's Office for June graduation
March 31 and April 1	Fri. and Sat.	Comprehensive examinations for Master of Arts candidates
March 31-April 5	Fri.-Wed.	Easter recess for On-Campus students and Off-Campus students in Education
April 8	Sat.	Graduate Record Examination
April 28	Fri.	Last day for submitting to the Dean theses of June Master's candidates
May 11	Thurs.	Information, Education, and Training Officers Luncheon, Faculty Club, 12:30 P.M.
May 17	Wed.	Last day of On-Campus classes for spring semester
May 22-31	Mon.-Wed.	On-Campus examination period
May 30	Tues.	Memorial Day holiday
June 4	Sun.	Baccalaureate Sermon
June 7	Wed.	Commencement
SUMMER SESSIONS:		
*May 29-June 9	Mon.-Fri.	Registration† for summer classes in the Off-Campus Division
June 19	Mon.	Registration† On-Campus for the eight-week term
June 20	Tues.	Classes begin on campus
July 4	Tues.	Independence Day holiday
July 7-8	Fri.-Sat.	Comprehensive examinations for Master of Arts candidates
Aug. 1	Tues.	Last day for applying in the Registrar's Office for October graduation
Aug. 11	Fri.	Summer Sessions end on Campus
		Last day for submitting to the Dean theses of October Master's candidates
‡Sept. 21-23	Thurs.-Sat.	Registration on Campus for the fall semester of the academic year 1961-62

* † ‡ See footnotes on preceding page.

THE BOARD OF TRUSTEES

The Board of Trustees of the University is composed of the President of the University ex officio and the following persons by election:

Newell Windom Ellison, A.B., LL.B., LL.D., *Chairman*

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Godfrey Leon Munter, A.B., LL.B., LL.D., *Assistant Secretary*

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Leonard Carmichael, Ph.D., Sc.D., LL.D., Litt.D., L.H.D., D.C.L.

Eugene Cassin Carusi, A.M., J.D.

*Watson Davis, B.S. in C.E., C.E., Sc.D.

R. Roy Dunn

Robert Vedder Fleming, LL.D., *Chairman Emeritus*

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John Edgar Hoover, LL.M., LL.D.

Frank Atherton Howard, B.S. in M.E., LL.B.

Joseph D. Hughes, B.S., LL.B., LL.M., LL.D.

Alfred Henry Lawson, LL.B., LL.D.

John Keown McKee

Benjamin Mosby McKelway, Litt.D.

James Matlack Mitchell, A.M.

*George Edward Muth, A.B., LL.B.

*Frederick A. Reuter, M.D.

*Charles Sylvanus Rhine, LL.B., D.C.L., LL.D.

Donald D'Arcy Shepard, LL.B.

Carleton D. Smith

Sidney William Souers, A.B., LL.D.

Lewis L. Strauss, Sc.D., LL.D., L.H.D.

L. Corrin Strong, Ph.B., LL.D.

James Edwin Webb, A.B., LL.D.

*Frank Harvey Weitzel, A.B., LL.B.

Alexander Wetmore, Ph.D., Sc.D.

Watson W. Wise, Ph.B.

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Lyman James Briggs, Ph.D., Sc.D., D.Eng., LL.D.

Mrs. Wilbur John Carr

* Nominated by the alumni.

Mrs. Joshua Evans, Jr., A.B., Ed.D.

Ulysses S. Grant, 3d, B.S., Graduate United States Engineers School,
LL.D., Sc.D.

Gilbert Grosvenor, A.M., LL.D., Litt.D., Sc.D.

Walter Rupert Tuckerman, A.B., LL.B., LL.D.

Charles Stanley White, M.D., Sc.D.

Lloyd Bennett Wilson

OFFICERS OF ADMINISTRATION

THE UNIVERSITY

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_____, *Administrative Secretary*

Henry William Herzog, B.S., *Treasurer*

Claud Max Farrington, A.M., *Assistant to the President*

Joseph Young Ruth, A.B., *Director of Admissions*

Frederick Russell Houser, A.M. in Govt., *Registrar; Secretary of the Faculties*

John Russell Mason, A.M., M.S. in L.S., *Librarian; Curator of Art*

Charles William Cole, Ph.D., *Dean of the Summer Sessions*

Benjamin Douglass Van Evera, Ph.D., Sc.D., *Dean for Sponsored Research*

Mitchell Dreese, Ph.D., *Dean in the Office of the President*

Virginia Randolph Kirkbride, A.M., Ed.D., *Director of Activities for Women*

Don Carlos Faith, Ph.D., *Director of Activities for Men; Director of Veterans Education*

Joseph Richard Sizoo, A.M., D.D., Litt.D., LL.D., L.H.D., S.T.D., *Director of University Chapel*

Alan Thomas Deibert, A.M., *Adviser to Students from Foreign Countries*

Richard Bernard Castell, A.B., M.D., *Director of Health Administration*

Loretta May Stallings, A.M., *Director of Women's Athletics*

Robert Faris, B.S., *Director of Men's Athletics*

Edward Martin Wall, A.B., LL.B., *Director of Air Science*

John Francis Latimer, Ph.D., *Associate Dean of Faculties; University Marshal*

THE COLLEGES, SCHOOLS, AND DIVISIONS

George Martin Koehl, A.M., *Dean of the Junior College*

Calvin Darlington Linton, Ph.D., *Dean of Columbian College*

Arthur Edward Burns, Ph.D., *Dean and Chairman of the Graduate Council*

John Parks, M.S., M.D., *Dean of the School of Medicine; Medical Director of the University Hospital*

Charles Bernard Nutting, A.B., J.D., LL.M., S.J.D., LL.D., Litt.D., L.H.D., *Dean of the National Law Center*

Louis Harkey Mayo, B.S., LL.B., J.S.D., *Dean of the Graduate School of Public Law*

Martin Alexander Mason, B.S. in Eng., Ing.-Dr., *Dean of the School of Engineering*

Charles Watson Bliven, M.S., *Dean of the School of Pharmacy*

_____, *Dean of the Law School*

James Harold Fox, A.M., Ed.D., *Dean of the School of Education*

Archibald Mulford Woodruff, Ph.D., *Dean of the School of Government*

Grover LaMarr Angel, A.M., Ed.D., *Dean of the College of General Studies*

Elmer Louis Kayser, Ph.D., LL.D., *Dean of the Division of University Students*

Warren Reed West, Ph.D., *Dean of the Division of Special Students*

Angus MacIvor Griffin, Ph.D., *Associate Dean of the School of Medicine*

Alvin Edward Parrish, M.D., *Associate Dean of the School of Medicine*

Victor Frederick Ludewig, A.B., B.S., *Administrator of the University Hospital*

John Gage Allee, Jr., Ph.D., *Associate Dean of the Division of University Students*

William Lewis Turner, Ph.D., *Assistant Dean of the Junior College*

James Cecil King, Ph.D., *Assistant Dean in the Junior College*

Calvin Weir Pettit, Ph.D., *Assistant Dean of Columbian College*

Carville Dickinson Benson, A.B., LL.B., S.J.D., *Assistant Dean of the Law School*

Edward Andrew Potts, A.B., LL.B., *Assistant Dean for Development in the Law School*

Carl Hugo Walther, B.E., M.C.E., *Assistant Dean in the School of Engineering*

Robert Meyer Leonard, Ph.D., *Assistant Dean of the School of Pharmacy*

Blake Smith Root, A.M., Ed.D., *Assistant Dean of the School of Education*

Anthony Charles LaBue, B.S., Ed.D., *Assistant Dean of the School of Education*

Walter Harold Hayes, Jr., A.M., *Assistant Dean in the College of General Studies*

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

It was George Washington's hope that the "General Government" would extend toward such an institution "a fostering hand". No steps were taken by Congress to carry out the provisions of Washington's will, and the stock he had bequeathed for the establishment of a university in the District of Columbia became valueless owing to the failure of the Potomac Canal properties.

Meanwhile, however, a movement was started by private persons under the leadership of Luther Rice to establish an institution of higher learning at the seat of the National Government for the education of the Baptist ministry and to afford general collegiate training. In 1819 an association was formed by Luther Rice, Obadiah B. Brown, Spencer H. Cone, and Enoch Reynolds for the purpose of raising funds to buy land for the use of the college.

A group of the Nation's leaders who were especially interested in Washington's idea became patrons of the college and contributed to funds raised for the purchase of land and erection of buildings. Among them were James Monroe, President of the United States; William H. Crawford, Secretary of the Treasury; John C. Calhoun, Secretary of War; William Wirt, Attorney General; Return J. Meigs, Postmaster General; and thirty-two members of Congress.

Legally to implement the college a petition was made to Congress for the incorporation of "the General Convention of the Baptist Denomination in the District of Columbia for evangelical and literary purposes". This petition was denied by Congress, on April 26, 1820, because of its sectarian character.

Failing to obtain a denominational charter members of the association enlarged their objective to embrace national aims, and with the sponsorship of Government leaders there was presented in Congress a bill for the incorporation of "the Columbian Society for literary purposes", it being proposed to realize in this way "the aspirations of Washington, Jefferson and Madison for the erection of a university at the seat of the federal government."

Acting upon this second petition, on February 9, 1821, Congress chartered Columbian College in the District of Columbia, inserting in the charter by special action the provision "that persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College or denied any of the privileges, immunities or advantages thereof, for or on account of his sentiments in matters of religion".

Thus Columbian College in the District of Columbia was chartered by Congress as one of the early nonsectarian institutions of higher learning in the United States, under the distinguished favor of President James Monroe and members of his Cabinet.

A tract of approximately forty-seven acres, extending about one-half mile northwest of Boundary Street (Florida Avenue) between Fourteenth and Fifteenth Streets, was purchased and by 1822 the main building was completed sufficiently to use.

Two years later, when the first Commencement was held on December 15, 1824, Congress and the Supreme Court adjourned their sessions to enable their members to attend the exercises. President Monroe, John Quincy Adams, John C. Calhoun, Henry Clay, and the Marquis de Lafayette headed the eminent company in attendance.

By an act of Congress of March 3, 1873, the name of the College was changed to "Columbia University", in recognition of the enlarged scope of the institution. In 1884 the University was moved from its first location on "College Hill", now Columbia Heights, to the new University Hall built for it at Fifteenth and H Streets. Near-by buildings accommodated the School of Medicine and somewhat later, the Law School.

For a period of six years, from 1898 to 1904, the University was placed under control of the Baptist Denomination. In 1904 an act restoring the original secular character of the University and authorizing change of name to The George Washington University was passed by Congress.

Subsequently all colleges, schools, and divisions of the University except the School of Medicine were brought together in the area bounded by Nineteenth, Twenty-third, and G Streets, and Pennsylvania Avenue NW. The School of Medicine is situated on H Street between Thirteenth and Fourteenth Streets NW.

The endowment of the University is \$7,500,000.

THE COLLEGES, SCHOOLS, AND DIVISIONS

The George Washington University includes fourteen colleges, schools, and divisions, as follows:

The Junior College offers the work of the first two years of the four-year college program in the liberal arts and sciences and two years of

preprofessional work. Each of these curricula leads to the degree of Associate in Arts. It also offers two-year terminal curricula. Those in Accounting and Secretarial Studies lead to the degree of Associate in Arts; those in Home Economics and Physical Sciences lead to the degree of Associate in Science.

Columbian College offers the work of the junior and senior years of the four-year college program in the liberal arts and sciences leading to the degrees of Bachelor of Arts and Bachelor of Science. In cooperation with the Department of Pathology and the University Hospital, Columbian College offers a course in Medical Technology leading to the degree of Bachelor of Science in Medical Technology. It also offers the studies leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

The Graduate Council offers a program of advanced study and research leading to the degree of Doctor of Philosophy.

The School of Medicine offers work leading to the degree of Doctor of Medicine.

The Law School offers professional and graduate courses leading to the degrees of Bachelor of Laws, Juris Doctor, Master of Laws, Master of Comparative Law, and Doctor of Juridical Science.

The School of Engineering offers courses leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering, Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

The School of Pharmacy offers courses leading to the degrees of Bachelor of Science in Pharmacy and Master of Science in Pharmacy.

The School of Education offers undergraduate programs leading to the degrees of Bachelor of Arts in Education, Bachelor of Science in Home Economics, and Bachelor of Science in Physical Education, and graduate studies leading to the degrees of Master of Arts in Education and Doctor of Education.

The School of Government offers undergraduate programs of study in Foreign Affairs, Public Affairs, Accounting, Business Administration, Business and Economic Statistics, leading to the degree of Bachelor of Arts in Government. Graduate work is offered leading to the following degrees: Master of Arts in Government; Master of Arts in Public Administration; Master of Arts in Personnel Administration; Master of Business Administration; and Doctor of Business Administration.

The College of General Studies supplements the adult education program of the University through its Off-Campus Division, Campus Division, and Division of Community Services. This College offers programs leading to the degrees of Associate in Arts, Associate in Science, Associate in Secretarial Administration; Bachelor of Arts, Bachelor of Science in

Cartography; and Master of Arts in the fields of Controllershship, Governmental Administration, and Personnel Management.

The Division of University Students makes available courses for mature students, not candidates for degrees in this University.

The Division of Special Students makes available courses for students in the process of qualifying for degree candidacy.

The Division of Air Science offers a program of Air Force ROTC training which is integrated with the curricula of the colleges and schools of the University and leads to appointment as a commissioned officer in the United States Air Force Reserve.

The Summer Sessions.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

LOCATION

The George Washington University is in downtown Washington, four blocks west of the White House and east of the Potomac River with its extensive parkway. Within a few blocks are the buildings housing the offices of many of the departments of the Government.

GOVERNMENT

The government and general educational management of The George Washington University are vested in a self-perpetuating Board of Trustees, with the President of the University as a member ex officio. The members of the Board are named for a period of three years and are divided into three classes. The members of one class are elected at each annual meeting to fill the places of the members whose terms of office expire. Two members of each class are nominated by the Alumni Association.

COLLEGE OF GENERAL STUDIES

OFFICERS OF ADMINISTRATION

- GROVER LAMARR ANGEL, A.M., Ed.D., *Dean of the College of General Studies*
WALTER HAROLD HAYES, JR., A.M., *Assistant Dean in the College of General Studies*
ROBERT WHITTINGTON ELLER, B.S., A.M. in Ed., *Director of the Campus Division*
ROBERT CLINTON RUTLEDGE, A.M., *Director of the Off-Campus Division*

ADMINISTRATIVE ASSISTANTS

- JOHN GORDON BOSWELL, A.M. in Ed., *Assistant Director of the Off-Campus Division*
JACK WOOD CHARLES, A.M., *Assistant Director of the Off-Campus Division*
DONALD THOMAS MCNELIS, A.M., *Assistant Director of the Off-Campus Division*
ALEXANDER GRANT ROSE III, A.M., *Assistant Director of the Off-Campus Division*
JOHN ARNOLD TIMOUR, A.M., *Assistant Director of the Off-Campus Division*
JESSIE EDITH MULLINS, A.M., *Assistant to the Dean; Chief of the Registration Processing Section*
LILLIAN FOX QUIGLEY, *Assistant to the Assistant Dean; Assistant Director of the Division of Community Services*
RAY EUGENIA WALTERS, *Secretary to the Dean*
MARTHA ROBINSON WING, *Secretary to the Assistant Dean*
WILHELMINA HORNEY CRUTCHFIELD, A.B., *Secretary to the Director and Assistant Directors of the Off-Campus Division*
ELISABETH PIERCE CLARKSON, *Registration Processing Assistant*
RUTH PALMER SWEET, *Receptionist*
VICKI LYNN POWERS, A.B., *Clerk-Typist*

SPECIAL PROGRAM DIRECTORS

- MARY ELLEN COLEMAN, A.M., *Director of the Reading Clinic*
ZELLA MILLS HUSE, A.M., *Assistant Director of the Reading Clinic*
GRACE TEMPLE TOON, *Clinician in the Reading Clinic*
Reading Clinic, *Secretary in the Office of the Director of the Reading Clinic*

STAFF OF INSTRUCTION*

SEPTEMBER 1959—AUGUST 1960

- ALLEN WILLIAM ABBOTT, M.C.E., *Associate in Mathematics*
 JAMES RICHARD AHERN, M.B.A., *Lecturer in Business Administration*
 ROBERT JOHN ALEXANDER, M.S., *Lecturer in Geology*
 JOHN GAGE ALLEE, JR., Ph.D., *Associate Professor of English Philology*
 GROVER LAMARR ANGEL, A.M., Ed.D., *Professor of Education*
 JAMES ALDEN ARNOLD, Ph.D., *Associate Professorial Lecturer in English*
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 LEWIS JORDAN ASHLEY, M.B.A., *Lecturer in Business Administration*
 KENNETH CAMERON BACK, A.M., *Special Lecturer in the College of General Studies*
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 STANLEY LOUIS BERLINSKY, Ph.D., *Lecturer in Speech*
 JOHN JAMES BERNARD, LL.B., *Associate Professorial Lecturer in Business Administration*
 LEE SHEWARD BIELSKI, A.M., *Associate Professor of Speech*
 WILLIAM BRAXTON BLANKS, Ed.M., *Associate in Economics*
 DOWLING MARTIN BOLTON, A.M., *Associate Professorial Lecturer in Speech*
 JOHN GORDON BOSWELL, A.M. in Ed., *Associate in History*
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 SARA FRANCES BRAGDON, A.B., *Associate in Speech*
 CARLTON ERNEST BRETT, Ed.B., A.M., *Associate in English*

* Rank shown as of September 1, 1960.

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- ENSER WILLIAM COLE, JR., A.B., LL.B., LL.M., *Associate Professorial Lecturer in Public Administration*
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- GEORGE BENEDICT DEGENNARO, A.M., *Lecturer in English*
- ANTHONY BRUNO DEPASQUALE, A.M., *Associate in Mathematics*
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 MURIEL HOPE MCCLANAHAN, Ph.D., *Associate Professor of English Composition*
 EDWARD MCCRENSKY, Ed.M., *Professorial Lecturer in Public Administration*
 MABEL CATHERINE MCGRATH, *Associate in Secretarial Studies*
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 JAMES CARL MESSERSMITH, A.M., Ed.D., *Lecturer in Education*
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- WARREN NYSTROM, Ph.D., *Professorial Lecturer in Education*
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- JACK SAMUEL ORLICK, B.S., *Associate in Speech*
- DUANE LESLIE PACKARD, A.M., *Lecturer in Education*
- HARRY ROBERT PAGE, M.B.A., *Lecturer in Business Administration*
- PIERRE SAILLY PALMER, A.B., *Lecturer in Business Administration*
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- CABELL ARNOLD PEARSE, Ph.D., *Lecturer in Mathematics*
- RALPH HUGH PENNINGTON, Ph.D., *Lecturer in Mathematics*
- WILLIAM PERL, Ph.D., *Associate Professorial Lecturer in Psychology*
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- RICHARD POWERS, Ph.D., *Lecturer in Economics*
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RAY JOSEPH RICHARDS, A.B., C.L.U., *Associate Professorial Lecturer in Business Administration*

THOMAS WITWER RICHARDS, A.M., *Lecturer on Cartography*

ALLEN LEROY RIGGS, B.S., *Lecturer on Cartography*

ROBERT STANLEY RIPLEY, A.B., *Associate in English*

EDGAR ALDERSON ROBEY, A.B., *Associate in Secretarial Studies*

ALEXANDER GRANT ROSE III, A.M., *Associate in English*

ROBERT MARTIN ROTH, Ph.D., *Lecturer in Psychology*

VINCENT ROTUNDO, A.M., *Associate in Political Science*

ROBERT CLINTON RUTLEDGE, A.M., *Associate in English*

CAROL RUTH ST. CYR, Ph.D., *Associate Professor of Education*

HAROLD HENRY SAUNDERS, Ph.D., *Associate in History*

RICHARD HAROLD SCHLAGEL, Ph.D., *Assistant Professor of Philosophy*

WILSON EMERSON SCHMIDT, Ph.D., *Professor of Economics*

MILDRED HOLLANDER SHOTT, A.M., *Associate Professor of Secretarial Studies*

KENNETH ABRAM SHUTTS, A.M., *Associate in History*

BOYD BERKELEY SIBERT, JR., M.B.A., *Special Lecturer in the College of General Studies*

HARRY FRITCHEY SIEBER, JR., M.S., *Associate in Statistics*

DAROLD WAYNE SILKWOOD, M.S., *Associate in Mathematics*

MORRIS JAMES SLONIM, M.B.A., *Lecturer in Statistics*

WALTER ELLSWORTH SMITH, LL.B., *Special Lecturer in the College of General Studies*

WILLIAM ARTHUR SMITH, A.M., *Assistant Professor of Mathematics*

WALDO SOMMERS, Ph.D., *Associate Professor of Public Administration*

KENNETH MALCOLM SOWERS, A.M., *Lecturer in Business Administration*

STANLEY SPIEGEL, Ph.D., *Lecturer in Psychology*

THOMAS ALFRED STANHOPE, A.M., *Associate in English*

JAMES CHARLES STEPHENS, A.M., *Professorial Lecturer in Public Administration*

ROBERT BURNS STEVENS, A.M., *Associate in English*

HELEN SEEGAR STONE, Ph.D., *Lecturer in Psychology*

JOHN SALVATORE STRANO, B.S., *Associate in Mathematics*

WILLIAM HENRY STRUHS, JR., A.M., *Associate in English*

CHARLES FRANCIS SUTER, A.B., C.L.U., *Lecturer in Business Administration*

FRANCIS JOHN SULLIVAN, A.M., *Lecturer in Accounting*

HORACE FENNELL SYKES, M.S., *Associate Professorial Lecturer in Public Administration*

ROBERT WATSON SYLVESTER, Ph.D., *Lecturer in Psychology*

- NORMAN TALLENT, Ph.D., *Lecturer in Psychology*
 GASPARE BENJAMIN TAMBURELLO, A.M., *Associate in Romance Languages*
 ROLAND HENRY TANCK, Ph.D., *Lecturer in Psychology*
 MAXINE ELIZABETH TEETSEL, A.M., *Lecturer in Education*
 DOUGLAS HAROLD TELLER, A.B., *Lecturer in Art*
 RUTH TIEDEMAN, Ed.D., *Professorial Lecturer in Education*
 HOWARD ELSWORTH THOMAS, Ph.D., *Professorial Lecturer in Education*
 VALENTINE VASILY TIMKOVSKY, *Lecturer in Russian*
 JOHN ARNOLD TIMOUR, A.M., *Associate in English*
 NANCY MARIE TISCHLER, Ph.D., *Assistant Professor of English*
 VLADIMIR TOLSTOY, License en Theologie, M.S., *Lecturer in Russian*
 WILLIAM GEORGE TORPEY, Ph.D., *Special Lecturer in the College of General Studies*
 JOHN TROTT, Ed.M., *Lecturer in Education*
 FRED SALISBURY TUPPER, Ph.D., *Professor of English Literature*
 HOWARD CONRAD TURNAGE, M.S., *Associate in Mathematics*
 EDGAR ALLEN TURPIN, JR., A.B., LL.B., *Associate Professorial Lecturer in Business Administration*
 ARTHUR USCHER, M.B.A., *Associate Professorial Lecturer in Business Administration*
 JOHN KELLOGG WAITE, M.B.A., *Lecturer in Business Administration*
 PAUL WAKEFIELD, A.M., *Associate in English*
 FREDERICK WILLIAM WALTHER, M.B.A., *Associate Professorial Lecturer in Business Administration*
 VICTOR EUGENE WARNER, JR., A.B., *Lecturer in Russian*
 JAMES ROBERT WASON, A.B., *Lecturer in History and Economics*
 HARRY WEINGARTEN, Ph.D., *Associate in Statistics*
 HARLAND WALTER WESTERMANN, Ph.D., *Associate Professor of Geography*
 JOHN HOWELL WHITE, A.M., *Associate Professorial Lecturer in Mathematics*
 JOSEPH LAWRENCE WHYTE, B.S., LL.B., C.L.U., *Lecturer in Business Administration*
 AKSEL CHRISTOPHER WIIN-NIELSEN, Ph.D., *Lecturer in Geography*
 CARL PACKARD WOLLE, Ph.D., *Lecturer in Public Administration*
 WILLIAM WOLFGANG WOLMAN, A.M., *Associate in Mathematics*
 BURTON WRIGHT, M.S., *Associate in Psychology*
 ELIZABETH TRUMAN WRIGHT, A.M., *Assistant Professor of English Composition*
 ROBERT GLENN WRIGHT, A.M., *Associate in English*
 WILLIAM PACKARD YOUNG, A.M., *Lecturer in Education*
 GUY GEOFFREY ZIEGLER, B.S., *Associate in Mathematics*
 ARTHUR JAY ZIFFER, M.S., *Associate in Mathematics*

COMMITTEES*

THE DEAN'S COUNCIL†

1960: C. H. Walther; 1961: A. R. Johnson, B. S. Root; 1962:
D. C. Faith, B. D. Van Evera

COMMITTEE ON UNDERGRADUATE ADMISSION AND ADVANCED STANDING
G. L. Angel (*Chairman*), J. C. Dockeray, J. W. Harkness, L. P. Leg-
gette, G. E. McSpadden, H. W. Westermann, J. Y. Ruth (*ex officio*)

COMMITTEE ON GRADUATE STUDIES

G. L. Angel (*Chairman*), D. S. Brown, I. B. Hansen, A. R. Johnson,
J. N. Mosél, F. S. Tupper, J. Y. Ruth (*ex officio*)

COMMITTEE ON SCHOLARSHIP

W. H. Hayes, Jr. (*Chairman*), H. G. Detwiler, Florence Mears, Waldo
Sommers, F. R. Houser (*ex officio*)

COMMITTEE ON CURRICULUM AND PROGRAMS

B. D. Van Evera (*Chairman*), J. H. Coberly, R. W. Stephens

GENERAL INFORMATION

The objectives of the College of General Studies are to extend the adult education facilities of the University; to introduce experimental procedures in conducting programs of study for mature students; and to provide auxiliary educational services other than formal programs of study for the community.

Established in October 1950, the College of General Studies is organized into the following divisions: the Off-Campus Division, the Campus Division, and the Division of Community Services. Its offices are in building F at 706 Twentieth Street NW.

ACADEMIC STANDARDS

The staff of instruction is made up of members of the regular University Faculty and staff of instruction and other individuals of recognized academic and professional competence.

The academic standards of the University are maintained in off-campus credit courses.

Limits on the size of classes may be imposed in order to maintain the quality of instruction.

* The Dean and Assistant Dean are members *ex officio* of all committees.

† The Dean of Faculties, the Dean and Assistant Dean in the College are members *ex officio* of the Council.

OFF-CAMPUS DIVISION

This Division works closely with personnel administrators, training officers, school officials, and others interested in developing programs of in-service training, in response to increased demands of government, education, business, and industry. Programs are also offered for service personnel who wish to work toward degrees or for professional proficiency. Off-Campus centers are listed on pages 49-70.

TYPES OF PROGRAMS

The College will offer a course in any liberal arts field on the college or university level for which there is a sufficient demand and for which a qualified instructor can be found, regardless of whether or not it is included in the regular offering of the University. According to the subject matter and the wish of the organizing group, courses are arranged as credit courses applicable toward a degree or as noncredit courses. For information concerning arrangements for courses or comprehensive programs of study, phone FEderal 8-0250, Extension 486 or 441.

HOW TO ORGANIZE AN OFF-CAMPUS PROGRAM

Any organization, group, installation, or agency interested in having the University organize and conduct a course or a comprehensive educational program, should get in touch with the Off-Campus Division of the College of General Studies (FEderal 8-0250, Extension 487 or 441). A representative will be sent upon request to discuss organizational plans.

TELEVISION COURSES

In cooperation with Channel 9, WTOP-TV in Washington, the College of General Studies offered during 1959 credit and noncredit Russian language television courses, "Classroom Nine: Beginning Russian." During the spring semester of 1960 a credit and noncredit course in "Conversational Russian" was offered, and during the summer session a noncredit course in "Art and Design" was offered. The schedule of television courses was Monday, Wednesday, and Friday from 6:30 to 7:00 A.M. The tuition fee for students registering for 3 semester hours of credit was \$75; for noncredit students, \$15. The registration fee included the cost of the textbook and a special telecourse guide.

Additional television courses may be offered from time to time. For further information telephone Jack W. Charles, College of General Studies, 706 Twentieth Street NW., FEderal 8-0250, Extension 487.

The Coordinator for television programs is Lillian Brown, Director of Radio and Television, Building S, Room 22, 2025 H Street NW.; FEderal 8-0250, Extension 370.

ADMISSION

Registration in an off-campus course constitutes admission to that course only. It does not constitute admission to degree candidacy or carry with it permission to attend University classes on campus.

CREDIT COURSES

Registration is conducted before or at the first meeting of each class. Transcripts of previous academic work are not required. Registration is restricted to those whose qualifications indicate that they are able to complete the courses successfully.

Auditing.—With the permission of the instructor, adequately prepared students may register as "Auditors". An auditor is not required to take active part in the exercises or to take examinations. No grades will be reported, and no credit will be received. Tuition is the same as for credit courses. If a course has 15 sessions a student may, with the approval of the Dean, change from credit to audit status prior to the 10th class session. If a course has 30 sessions, a student may, with the approval of the Dean, change from credit to audit status prior to the 20th class session. A student will not be permitted to change from audit to credit status after the second class session of any course.

Concurrent Registration.—A student registered as a degree candidate in any other college or school of the University may take credit courses in the College of General Studies *only by permission (granted prior to registration) of the dean* of the college or school concerned. Special forms for "Concurrent Registration" must be filled out at the time of registration in the College of General Studies.

NONCREDIT COURSES

Noncredit courses are open to anyone interested in enrolling. When a course is organized at the request of a particular agency or group, admission may be restricted to the students recommended by the sponsoring organization.

DEGREE CANDIDACY

Application for degree candidacy should be made only if there is a reasonable assurance that the student will be in the area long enough to complete the requirements. Credits granted by this College for the General Educational Development tests and for service schools and correspondence courses may or may not be accepted by another institution or by other schools and colleges of this University.

The following factors are considered in determining the eligibility of an applicant:

1. The adequacy of previous academic work as preparation for the

course of study contemplated, including quantity and quality of work and the standing of the institution in which it was done.

2. Results of specified tests, when prescribed by the Committee on Admissions.

3. The aptitude of the student for the curriculum contemplated.

4. The character of the student.

The University reserves the right to refuse admission to any student who has a previous academic record of such grade as to create doubt of his ability to pursue college work successfully, or who, for any other reason, would not be an acceptable student.

METHODS OF ADMISSION

FROM SECONDARY SCHOOLS

An applicant from a secondary school may seek to qualify for admission to degree candidacy by certificate or examination. In either case, the applicant must send the high school record form, available at the Office of the Director of Admissions or at the College of General Studies, to his high school principal with the request that the principal fill it out and mail it directly to the Office of the Director of Admissions, The George Washington University, Washington 6, D. C.

Consideration for admission is based upon the combined evidence of (1) an acceptable certificate of graduation, showing a minimum of fifteen "units"* from an accredited secondary school; (2) the principal's statement that the applicant is adequately prepared to undertake college work with reasonable prospect of success; (3) tests as specified by the Committee on Undergraduate Admission and Advanced Standing, and (4) course work completed with the College of General Studies prior to making application for admissions. (See Special Requirements for Admission to Degree Candidacy.)

Certification by the principal that the student has satisfied all curriculum requirements of the school will be accepted in lieu of any prescribed distribution of units.

A desirable secondary school program in preparation for college would include: four years of English, at least two years of one foreign language, two years of natural or physical science with laboratory instruction (over and beyond the so-called "General Sciences"), two or three years of social studies (with concentration on history), one or two years of basic mathematics.

The Committee on Admission and Advanced Standing will consider the adequacy of the qualifications for academic success of an applicant who, because of unusual circumstances, does not present all the formal requirements stated above.

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

FROM HIGHER INSTITUTIONS

An applicant for advanced standing may be considered for admission upon the presentation of satisfactory credentials from an accredited institution of higher learning.

Properly certified courses taken at accredited colleges or universities may be applied toward a degree in the College of General Studies, subject to the curriculum requirements of the degree program for which admission is sought. Work of low passing grade (such as *D* or the equivalent) is not acceptable for transfer.

The University reserves the right to refuse credit for transfer in whole or in part, or to allow it provisionally. Credit so given may be withdrawn for subsequent poor work.

It is the responsibility of the student to have an official transcript sent directly from each educational institution formerly attended to the Office of the Director of Admissions, The George Washington University, Washington 6, D. C.

SPECIAL REQUIREMENTS FOR ADMISSION TO DEGREE CANDIDACY

To be eligible for admission to degree candidacy the student must have satisfactorily completed 6 semester hours of approved academic work in the College of General Studies. Twelve semester hours of acceptable work are required of applicants whose previous college records might make admission questionable. A grade of *C* or better is required for such qualifying courses toward undergraduate degrees; for Master's candidacy an average of *B* or better is required for undergraduate prerequisite courses, *S* (satisfactory) or *E* (excellent) for graduate courses.

Application for degree candidacy should be filed as soon as the required 6 hours are satisfactorily completed.

Students must confer with the Assistant Dean, the Director of the Campus Division, or the Director of the Off-Campus Division before applying for admission to degree candidacy. Appointments may be made by telephone (FEderal 8-0250, Extension 441 or 487) or by letter.

ADVANCED STANDING

In addition to credit allowed in transfer from other accredited colleges or universities, see "From Higher Institutions", above, advanced standing may be obtained by the following methods. For detailed information concerning advanced standing acceptable in the curriculum contemplated, see "Advanced Standing" under the degree concerned.

1. *GED Tests*.—A maximum of 24 semester hours obtained on the basis of the College Level GED test (first year):

Test 1: Correctness and Effectiveness of Expression

English 1-2: *English Composition* (6)

Test 2: Interpretation of Reading Materials in the Social Studies
Political Science 9: *Government of the United States* (3)

Sociology and Anthropology 1: *Man in Modern Society* (3)

Test 3: Interpretation of Reading Materials in the Natural Sciences
Chemistry 3-4: *Fundamentals of Physical Sciences* (6)

Test 4: Interpretation of Literary Materials

English 51-52: *Introduction to English Literature* (6)

Credit earned by GED tests does not substitute for courses required in or prerequisite to a departmental major, and must not duplicate credits previously earned in college courses. Service personnel make arrangements to take GED tests, prior to or at the time of applying for degree candidacy, through the education officers; civilian students, through the Dean or Assistant Dean, at the time of applying for degree candidacy. No decision on an application can be reached until the tests have been evaluated.

2. *Service Schools*.—A maximum of 24 semester hours may be obtained on the basis of service schools satisfactorily completed, as evaluated by the United States Armed Forces Institute Guide to the Evaluation of Educational Experience in the Armed Forces. Ordinarily such credits are counted as electives. No credit will be allowed for military experience as such.

3. *Validating Examinations*.—A maximum of 12 semester hours may be obtained by validating examinations. With the approval of the Dean or the Assistant Dean and the department concerned, permission to take such examinations is granted those who are qualified by work experience and background. Validating examinations must be completed during the first full semester in which the student is registered as a degree candidate. The fee for each three-hour course examination is \$25.

4. *Correspondence Courses*.—A maximum of 12 semester hours may be earned through the successful completion of approved correspondence courses of college level.

EXAMINATION FOR WAIVING CURRICULUM REQUIREMENTS

During the first full semester of degree candidacy, a student wishing to omit a required course may, with the permission of the Dean or the Assistant Dean, take a waiver examination, the passing of which relieves him of the curriculum requirement and qualifies him for registration in an advanced course. *Passing of the waiver examination does not entitle the student to credit toward a degree.* The fee for each three-hour course examination is \$5.

FEES

Application fee, charged each applicant for admission to degree candidacy (payable by check or money order only and sent directly to Office of the Director of Admissions), nonrefundable	\$10.00
Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable	5.00
Graduation Fee	
For the degree of Associate in Arts	10.00
For the degree of Associate in Science	10.00
For the degree of Associate in Secretarial Administration	10.00
For the degree of Bachelor of Arts	25.00
For the degree of Bachelor of Science in Cartography	25.00
For the degree of Master of Arts	25.00
Tuition Fees	
For each semester hour for which a student registers on-campus	24.00
For each semester hour for which a student registers off-campus	17.00
The Education Program of the Armed Forces may defray a maximum of \$7.50 a semester hour, for service personnel.	
Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree in the College of General Studies. (For procedure, see Graduate Record Examination, page 31)	10.00
Fee for binding the Master's thesis	6.00
Withdrawal fee, charged each student who drops a course for which he is registered, before the first class meeting	5.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in payment of fees	5.00
Residence fee, charged each off-campus degree candidate who wishes to maintain "in residence" status during any semester of absence from the University	17.00
Residence fee, charged each on-campus degree candidate who wishes to maintain "in residence" status during any semester of absence from the University	24.00
General Education Development Battery (GED tests) fee (college level)	8.00
Fee for each examination to waive a curriculum requirement	5.00
Validating Examination fee	25.00
Transcript fee, charged for each transcript of record after the first	1.00

* Payable at the time of application for transfer.

PAYMENT OF FEES

OFF-CAMPUS COURSES

For fifteen-week credit course. Payable in 3 equal installments: the first at time of registration; the second, 30 days after the beginning of the course; the third, 60 days after the beginning of the course. A student who fails to complete all tuition payments no later than 15 days after the final installment is due will be automatically suspended and may not attend classes or take final examinations until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of \$5.

For eight-week credit course. Payable in full at registration

For noncredit course. Payable in full at registration

CAMPUS COURSES

For regulations governing the payment of fees for Campus courses, see the University catalogue.

REFUND OF FEES

In no case will a refund of fees be made for eight-week credit courses or for noncredit courses unless the course is cancelled.

Fifteen-week credit courses.—In no case will the initial payment for a course be refunded unless the course is cancelled. The second and third payments will be waived or refunded if the course is dropped within the first thirty days. The third payment will be waived or refunded if the course is dropped within the second thirty days. No refund will be allowed on withdrawal subsequent to the second thirty-day period.

This regulation does not apply if a student withdraws from one course to enter another, or if a class is cancelled because of insufficient enrollment.

VETERANS EDUCATION

The George Washington University is approved to provide training for eligible persons under the provisions of Public Laws 634, 190, 550, 16, and 894. The Office of Veterans Education, Building Q, 2029 H Street NW. (Telephone: FEderal 8-0250, Extension 334) operates as a service bureau for such persons interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration. Here information may be obtained concerning the educational program of the University and the procedures for securing educational benefits under the GI and War Orphans bills.

Veterans should consult the Office of Veterans Education concerning possible educational eligibility and benefits before considering application to the College of General Studies for instruction or degree candidacy.

PUBLIC LAW 634 (War Orphans Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

PUBLIC LAW 190 (World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1956, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

PUBLIC LAW 550 (Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950, and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

PUBLIC LAWS 16 AND 894 (Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to the Veterans Administration for approval of their training objectives at least sixty days prior to registration.

REGULATIONS**ATTENDANCE**

The student is held responsible to the instructor in charge of the course for all of the work of the course. All absences must be excused before provision will be made for the student to make up work missed.

Absences will be excused if the number of class hours missed does not exceed the semester hours for the course. In a fifteen-week course in which classes meet once a week, one unexcused absence is permitted. In a fifteen-week course in which classes meet twice a week two unexcused absences are permitted. In an eight-week course meeting twice a week, one unexcused absence is permitted.

Absences immediately preceding or following holiday periods are counted double.

Excuses for two or more consecutive class periods, and for absences from examinations which have been announced in advance, may be obtained only by making written application to the instructor.

SCHOLARSHIP

GRADES

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors or the administrative staff of the College.

Undergraduate Grading System.—*A*, excellent; *B*, good; *C*, average; *D*, passing; *F*, failing. Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be assigned. The symbol *I* indicates that a satisfactory explanation has been given the instructor for the student's failure to complete the work of the course. An "incomplete" cannot be made up after the lapse of one calendar year, except by written permission of the Dean's Council.

A student may not repeat, for a grade, a course in which he has received a grade of *D* or above, unless required to do so by the department concerned.

Graduate Grading System.—*E* (excellent), *S* (satisfactory), *U* (unsatisfactory), *I* (incomplete), and *W* (authorized withdrawal).

QUALITY-POINT INDEX

Quality points are computed from grades as follows:

For each semester hour of the letter grade—*A*, 4 points; *B*, 3 points; *C*, 2 points; *D*, 1 point; *F*, no points.

Scholarship is computed in terms of the quality-point index. This is done by dividing the total number of quality points by the total number of semester hours for which the student has registered. Example: if a student received an *A* in one three-credit course, and a *B* in another three-credit course, he would compute his quality-point index in this way:

$$\begin{array}{r} A = 4 \times 3 \text{ (semester hours)} = 12 \\ B = 3 \times 3 \text{ (semester hours)} = 9 \\ \hline 6 \end{array}$$

$$21 \div 6 = 3.5 \text{ quality-point index}$$

Courses marked *W* or *I* are not considered in determining the index. If an *I* is not superseded by a proper grade within one calendar year, it is automatically computed as zero quality points. Grades in courses taken at other institutions are not considered in computing the quality-point index.

WARNINGS

At stated intervals during the academic year instructors file in the Office of the College of General Studies the names of those students taking courses with departmental numbers below 100, who are doing work of *D* grade or lower. A "warning" will then be sent to the student. A "warning" constitutes notice to the student that he must consult his instructor at the earliest opportunity. "Warning periods" are established during the seventh and eighth weeks of fifteen-week courses, and during the third and fourth weeks of eight-week courses.

PROBATION

A student must maintain a quality-point index of at least 2.00 or be placed on probation.

A student who has attempted 12 or more semester hours of work and whose quality-point index is between 1.50 and 2.00 will be placed on probation for the period in which he attempts 12 additional semester hours of work. If his quality-point index is still below 2.00 at the end of this probationary period he will be suspended. The Committee on Scholarship reserves the right to extend the period of probation even if the student has earned an average of above 2.00. A student placed on probation for a third period, whether successive or after an interval, will be suspended.

SUSPENSION

A student who has attempted 12 or more semester hours of work and whose quality-point index is below 1.50 is subject to suspension; however, a student who has a quality-point index between 1.40 and 1.50 will be considered by the Committee on Scholarship, which may retain him on probation or suspend him.

A student who is subject to probation for the third time, whether successive or after an interval, will be suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. In applying for readmission he must submit specific evidence to the Committee on Scholarship that he is better qualified to pursue college work. A student suspended twice for poor scholarship will not be readmitted.

READMISSION

A student who withdraws, is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return. Forms for readmission may be obtained from the Office of Admissions of the University. Complete and official transcripts from each

institution the student has attended since making his previous application must be sent to the Office of the Director of Admissions before his application for readmission can be evaluated.

CHANGES IN PROGRAM OF STUDIES

DROPPING A COURSE

Courses meeting once or twice a week for $2\frac{1}{2}$ hours may be dropped without academic penalty during the first 10 class periods, and courses meeting once or twice a week for $1\frac{1}{4}$ hours may be dropped without academic penalty during the first 20 class periods. The procedure is as follows:

1. Secure a University drop slip from the instructor or from the Training Officer.
2. Fill out the drop slip and have it signed and dated by the instructor.
3. Mail it to the College of General Studies, The George Washington University, Washington 6, D. C.

Withdrawing from a course without academic penalty after the 10th or 20th class meeting, as the case may be, requires approval of a written request, which should be addressed to the Dean of the College of General Studies.

Notifying an instructor of the intention to drop a course does *not* constitute an official withdrawal. Failure to follow the proper procedure will result in an automatic grade of *F* and, regardless of the time of discontinuance, will not relieve the student of financial responsibility for the entire course. (See "Refund of Fees" page 25.)

TRANSFER WITHIN THE UNIVERSITY

Transfer to the College of General Studies, as a degree candidate, from another college, school, or division of the University may be made only with the approval of the deans concerned. Application for transfer should be made on the transfer form, which is available at the Office of the Director of Admissions. An insert form, obtainable at the College of General Studies, must also be filled out. Upon transfer the student should consult the Dean and understand clearly the requirements he must fulfill.

A maximum of 45 semester hours is transferrable toward the degrees of Associate in Arts, Associate in Science, and Associate in Secretarial Administration; 90, toward the degrees of Bachelor of Arts and Bachelor of Science in Cartography; and 12, toward the degree of Master of Arts. Students transferring within the University are advised to note the residence requirements of the degree sought.

CREDIT

Credit toward a degree is given only after regular registration for and satisfactory completion of the required work of classes in the University, or upon the granting of advanced standing in accordance with the regulations of the College of General Studies.

On request the Registrar will issue to the student a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations.

TRANSCRIPTS OF RECORD

Official transcripts of student records will be forwarded on request to other institutions. Unofficial copies of records will be issued to the student on request. No charge is made for the first copy; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a student who does not have a clear financial record.

GRADUATION REQUIREMENTS

To be recommended for graduation a student must have met the admission requirements of the College, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—It is the student's responsibility to file an application for graduation in the Office of the Registrar at the time of registration for the last semester of course work needed to complete the degree requirements. The last day on which applications will be accepted is stated in the calendar.

Scholarship.—The undergraduate must have a general quality-point index of 2.00. Candidates for the Bachelor's degrees must, in addition, have a quality-point index of 2.50 in the major. The graduate student must have at least the grade of S (satisfactory) in all courses.

Curriculum.—See the requirements for the degree concerned.

Residence.—A student is "in residence" only when registered for course work after making application for admission to degree candidacy or for the 6 semester hours undertaken to qualify for degree candidacy (see the specific residence requirements for the degree concerned).

If there is an interruption in the residence status, the student must apply for readmission to degree candidacy and meet any changes in curriculum which have been made since his original admission.

With the permission of the Dean, a student may be granted leave of absence; such student should, however, remain technically in residence by paying the residence fee for each semester he is absent. For the purpose of this regulation, the summer session will be disregarded.

By special arrangement, service personnel who receive military transfers when they are within 6 hours of a degree, will be permitted to complete their work elsewhere, transfer these credits to the College of General Studies, and receive a degree from this University. This procedure does not apply to Master's candidates who have been granted 6 hours of transferred credit.

Graduate Record Examination.—During the senior or final year candidates for the Bachelor's degrees in the College of General Studies are required to take the Graduate Record Examination: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and Area Tests (achievement), which measure breadth of knowledge and understanding in three broad areas of the liberal arts: Natural Science, Social Science, and the Humanities. The examinations are conducted by the University twice a year: the Fall Testing Session (December 10, 1960) for students graduating in February, and the Spring Session (April 8, 1961) for those graduating in June or October.

As a part of registration for the final semester of undergraduate study, each student is responsible for applying for the Graduate Record Examinations. Application is to be made on the appropriate form and sent to the Office of the Cashier, 725 Twenty-first Street, Washington 6, D. C., together with a check or money order for \$10, made out to The George Washington University.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis.—A thesis, submitted in partial satisfaction of requirements for the Master's degree, must be submitted in its final form to the Dean no later than the date specified in the calendar. Three complete copies of each thesis are required. It is the responsibility of the candidate for a graduate degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the thesis. These regulations are rigidly enforced. (See pages 45-46.)

Accepted theses, with accompanying drawings, become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the Dean.

Presence at Graduation.—A candidate is required to be present at the

graduation exercises unless written application for graduation *in absentia* is approved by the Dean. The application should be in duplicate, should state the reason for the request, and give the address to which the diploma is to be sent. Petition for graduation *in absentia* should be received in the Office of the Dean at least two weeks prior to graduation.

HONORS

Dean's List.—To be eligible for inclusion on the Dean's List, a full-time student must have a minimum quality-point index of 3.50 for the semester concerned; a part-time student must have a quality-point index of 3.50 on the last 12 semester hours of work and must have maintained continuous registration for at least one three-hour course during the period concerned. Eligibility for inclusion again will be determined on the basis of the subsequent 12 semester hours of work.

With distinction.—The undergraduate degrees may be conferred "with distinction", at the discretion of the Dean's Council of the College and the Committee on Scholarship of the University, if a student attains a quality-point index of 3.50 or higher on all work taken at this University. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—Special honors may be awarded to any member of the graduating class for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.
2. The student must meet such other conditions as may be set at the time his candidacy is approved.
3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.
4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

DISHONESTY

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration in any unit of the University.

Evidence of dishonesty on the part of any student will result in his suspension from the University upon the recommendation of the appropriate dean's council.

A student found guilty of dishonesty will be deprived of credit for *all* courses in the semester during which the dishonest act occurs.

A student may apply to be readmitted to the University in the semester or summer session which begins next after an interval of one year from the date of suspension.

THE LIBRARY

A student registered in the College of General Studies is entitled to the reference use of the University Library. The student receipt, issued upon the payment of tuition fees, must be presented as identification.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

COUNSELING

Students in the College of General Studies may obtain counseling and assistance in program planning in the offices of the College or from representatives of the Off-Campus Division at the installations and agencies at which courses are held. Appointments may be made by calling the College of General Studies: FEderal 8-0250, Extension 441, 486, or 487; or through the Education or Training Officer at individual installations. University counselors are also available at all installations and agencies during announced registration periods and, in some installations and agencies, at a scheduled time each month.

In addition, the services of The George Washington University Testing and Counseling Center are available to all students in the College of

General Studies. The counseling services are designed to assist individuals in making educational and vocational plans. The program requires twelve to sixteen hours of testing, scheduled in a series of three or four appointments. During this time, information concerning past experience, general ability, interest, personality, aptitudes, and achievement is obtained. Test results are interpreted and their implications discussed with the client. The Center is prepared to furnish related occupational and educational information. Clients are referred for specialized services when required. Follow-up is provided if requested.

The services offered by the Center include: aid in vocational choice; checking present training objectives; diagnosis of academic difficulties; checking suitability of present job; and special testing services, including General Educational Development Tests and Miller Analogies Test.

Fees.—Counseling Program: community clients under 21, \$35; community clients over 21, \$45. For students who are currently registered as degree students in the University, \$7.50; for students currently enrolled in the University but not as degree candidates, \$30. General Educational Development (college level): Battery, \$8; Individual, \$2; Miller Analogies Test, \$6. Fees for specialized testing are dependent upon the services involved.

All fees are payable at the time of testing at the Testing and Counseling Center.

Appointments may be made by phone, mail, or in person. The Center is open from 9:00 to 5:00 Monday through Friday. The office is in Building N, 718 Twenty-first Street NW., Washington 6, D. C. Telephone: FEderal 8-0250, Extension 463.

THE ASSOCIATE'S DEGREES

Upon the satisfactory completion of the requirements of the College of General Studies, the degree of Associate in Arts, Associate in Science, or Associate in Secretarial Administration is conferred.

Students who plan to continue working in this College toward the Bachelor's degree must apply to the Dean at the time of filing application for graduation for the degree of Associate in Arts. Forms for this purpose are available at the Office of the Registrar.

After completing the College of General Studies requirements for the degree of Associate in Arts, students may wish to transfer to one of the other schools or colleges within the University, or they may wish to transfer to another institution. However, modifications in admission, advanced standing, and curriculum requirements permitted by the College of General Studies may not be accepted in transfer. Therefore, while registered in the College of General Studies, students should meet the requirements of the college or university to which they wish to transfer. The entrance requirements of the colleges and schools of the University

are stated in the general catalogue of the University, which is available at the Office of the Director of Admissions.

ADVANCED STANDING

A maximum of 30 semester hours of advanced standing toward the degrees of Associate in Arts and Associate in Secretarial Administration may be earned, as explained in detail on pages 22-23.

REQUIREMENTS FOR THE DEGREES

A minimum of 50 per cent of the work for the degree must be completed off campus; a maximum of 50 per cent may be completed on campus.

RESIDENCE

At least the last 15 semester hours required for the degree must be completed while registered as a degree candidate (see page 30) in the College of General Studies. In both the Off-Campus Division and the Campus Division, the 6 semester hours required prior to admission to degree candidacy are accepted in partial satisfaction of the residence requirement, if the courses are approved as part of student's degree program. (See page 22.)

SCHOLARSHIP

The system of grading and computing scholarship is described in detail on page 27. For regulations concerning probation, suspension, and readmission, see pages 28 and 29.

CURRICULUM

The satisfactory completion of 60 semester hours of college work in conformity with one of the following curricula is required.

The College of General Studies offers two flexible programs of study, of 60 semester hours each, leading to the degree of Associate in Arts and preparing for admission to candidacy for the degree of Bachelor of Arts. One is for students interested in a broad general education. The other curriculum prepares students for work in the field of Business Administration during the last two years of college.

ASSOCIATE IN ARTS CURRICULA

GENERAL CURRICULUM

The following curriculum leads to the degree of Associate in Arts and constitutes the first half of the General Curriculum leading to the degree of Bachelor of Arts. For the second half, see pages 40 and 41.

Faculty Adviser: Walter Harold Hayes, Jr., A.M., Assistant Dean in the College of General Studies. Building F, Room 12 (706 Twentieth Street NW.), FEderal 8-0250, Extension 487 or 441.

	Semester Hours
English 1-2: English Composition	6
English 41-42: Introduction to World Literature; 51-52: Introduction to English Literature; 71-72: Introduction to American Literature; or Philosophy 51-52: Introduction to Philosophy.....	6
*Foreign Language	12
Social Studies: from economics, history, political science, sociology and anthropology, or Geography 51 and 52. Six hours in one department are required, unless Political Science 9 and Sociology and Anthropology 1 are satisfied by the GED Tests.....	6
Science: Chemistry 3-4: Fundamentals of Physical Science, or an introductory course in biology, botany, chemistry, geology, physics, or zoology (if arrangements cannot be made to offer such courses off campus, students may take these courses on campus).....	6 or 8
Elective	22 to 24
Total.....	60

BUSINESS ADMINISTRATION CURRICULUM

The following curriculum leads to the degree of Associate in Arts in Business Administration and constitutes the first half of the curriculum leading to the degree of Bachelor of Arts with a Major in Business Administration. For the second half, see pages 41 and 42.

Faculty Adviser: James Carlton Dockera, Ph.D., Professor of Finance and Executive Officer of the Department of Business and Public Administration. Building Y, Room 13 (802 Twenty-first Street NW.), FEderal 8-0250, Extension 512

	Semester Hours
English 1-2: English Composition.....	6
Accounting 1-2: Introductory Accounting.....	3
English 11: The Writing of Reports.....	12
*Foreign Language	6
Economics 1-2: Principles of Economics.....	3
Political Science 9-10: Government of the United States.....	3
Speech 1: Effective Speaking	3
†Statistics 51: Introduction to Business and Economic Statistics.....	3

* A student offering for admission four acceptable high school units in one foreign language or two units in each of two foreign languages is not required to take any foreign language. (A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of classroom work.) If he offers two units only, he must complete the entire second-year college course in the same language or the first-year college course in another language. The usual college requirement is two years of a single language, but since many College of General Studies students may subsequently be stationed abroad, some familiarity with two different foreign languages may be particularly useful. Therefore students may take one year each of two different foreign languages. Those who transfer to other institutions will probably have to take two years of one language and should be guided accordingly.

The high school units accepted under the above arrangements remove the college language requirement, but, do not count for college credit.

† Statistics 51 is offered on campus only. However, Statistics 101 and 102 *Basic Principles of Statistical Methods I and II* (3-3), which is offered off campus, may be substituted.

*Statistics 52: Mathematics of Finance.....	3
Elective (Students interested in Foreign Commerce include Geography 51)	9 or 12
Total.....	60

ASSOCIATE IN SCIENCE CURRICULUM

The curriculum leading to the degree of Associate in Science in the field of Physical Sciences is offered at the Naval Engineering Experiment Station, Annapolis, Maryland, by the College of General Studies and on campus by the Junior College. Students who have taken courses in this curriculum at installations where the entire program is not available may, if they meet the entrance requirements, transfer to the Junior College to complete the curriculum.

This curriculum is designed for part-time students who do not wish to extend their college education beyond 60 semester hours of work. No credit toward the degree will be granted for GED tests, service schools, correspondence schools, or validating examinations. All students interested in continuing the study of physical science toward a Bachelor's degree should consult the pre-Columbian College Science curriculum listed under the Junior College in the general catalogue of the University.

Faculty Adviser: Robert Whittington Eller, B.S., A.M. in Ed., Director of the Campus Division of the College of General Studies. Building F, Room 31 (706 Twentieth Street NW.), FEderal 8-0250, Extension 441 or 487

	Semester Hours
Chemistry 11-12: General Chemistry	8
Chemistry 21: Qualitative Inorganic Analysis.....	4
English 1-2: English Composition	6
English 11: The Writing of Reports.....	3
†Mathematics 3: College Algebra	3
Mathematics 6: Plane Trigonometry	3
Mathematics 12: Analytic Geometry	3
Mathematics 29: Calculus I	3
Mathematics 30: Calculus II	3
Mathematics 31: Calculus III	3
Mechanical Engineering 10: Graphical Communications.....	2
Physics 11, 12, 13: Introductory Physics.....	9
Physics 16: General Physics	3
Physics 55: Physical Measurements	3
Electives (Speech 1: Effective Speaking (3) and Economics 1-2: Principles of Economics (6) are recommended).....	4
Total.....	60

* Statistics 52 is offered on campus only. However, Statistics 58 *Mathematics of Business Administration* (3), which is offered off campus, may be substituted.
 † The Mathematics 3 requirement may be satisfied by two years of acceptable high school algebra; the Mathematics 6 requirement, by one-half year of high school trigonometry.

ASSOCIATE IN SECRETARIAL ADMINISTRATION CURRICULUM

This curriculum is designed for secretarial students who, in addition to obtaining the degree of Associate in Secretarial Administration, wish to prepare for the Certified Professional Secretaries' Examination for the certificate issued by the Institute for Certifying Secretaries, a body of the National Secretaries Association, International.

Faculty Adviser: Mildred Hollander Shott, A.M., Associate Professor of Secretarial Studies. Monroe Hall, Room 300, Federal 8-0250, Extension 447

	Semester Hours
Accounting 1-2: Introductory Accounting.....	6
Business Administration 102: Fundamentals of Management.....	3
Business Administration 109: Office Management.....	3
Economics 1-2: Principles of Economics.....	6
English 1-2: English Composition	6
English 41-42: Introduction to World Literature;	
English 51-52: Introduction to English Literature; or	
English 71-72: Introduction to American Literature.....	6
Psychology 1: General Psychology	3
Secretarial Studies 2: Intermediate Typewriting	3
Secretarial Studies 11: Elementary Shorthand and Transcription.....	3
Secretarial Studies 12: Intermediate Shorthand and Transcription.....	3
Secretarial Studies 15: Advanced Shorthand, Typewriting, and Transcription	3
Secretarial Studies 16: Secretarial Shorthand, Typewriting, and Transcription	3
Secretarial Studies 51: Business Correspondence	3
Secretarial Studies 54: Secretarial Practice	3
Speech 1: Effective Speaking or Speech 11: Voice and Diction.....	3
Statistics 51: Introduction to Business and Economic Statistics (3), or Statistics 101: Basic Principles of Statistical Methods I (3).....	3
Total.....	60

THE BACHELOR'S DEGREES

Upon the satisfactory completion of the requirements of the College of General Studies, the degree of Bachelor of Arts or Bachelor of Science in Cartography is conferred.

BACHELOR OF ARTS

The College of General Studies offers curricula leading to the degree of Bachelor of Arts in: (1) the General Curriculum, (2) Business Administration, and (3) departmental majors available to students in Columbian College or the School of Government. Many courses required for Columbian College and School of Government majors are available only on campus.

REQUIREMENTS FOR ADMISSION TO CANDIDACY

The degree of Associate in Arts in the College of General Studies, or the equivalent, and the permission of the Dean (see page 22) are required. Admission to Bachelor's candidacy after receiving the degree of Associate in Arts is not automatic. With the permission of the Dean, students with limited deficiencies in the requirements for admission may be conditionally admitted to degree candidacy while they make up academic deficiencies.

Students with acceptable college records from other institutions must complete 6 semester hours, with the grade of *C* or better, before applying for degree candidacy.

Students with questionable previous college records may be accepted on probation to complete 24 semester hours, with the grade of *C* or better, before final consideration of degree candidacy.

A conference concerning plans for study is required of each applicant for admission to candidacy. Appointments may be made with the Assistant Dean or the Director of the Off-Campus Division by telephone (FEederal 8-0250, Extension 441 or 487) or by letter.

Advanced Standing

In addition to credit allowed in transfer from other accredited colleges or universities, see "From Higher Institutions", page 22, advanced standing may be obtained by the following methods.

1. By validating examinations, service schools, and correspondence courses. From any combination of these sources, the maximum credit that may be obtained is 15 semester hours. The maximum credit obtained from any one of these sources may not exceed that stated on pages 22-23. No credit may be obtained in this way, however, if the student has been credited with the maximum of 30 semester hours toward the degree of Associate in Arts.

2. By GED tests. Advanced standing is limited to students registered in the General Curriculum or the Business Administration Curriculum and is granted only for courses in the Associate in Arts Curriculum (pages 35-36) which are prerequisite to advanced courses in the student's Bachelor's program.

REQUIREMENTS FOR THE DEGREE

Degree candidates in the Off-Campus Division must complete at least 50 per cent of the work taken at this University in off-campus courses.

Residence

The last 30 semester hours, including at least 12 hours in the major field, must be completed in residence in the College, unless special permis-

sion is granted by the Dean to take work elsewhere. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work and the 6 hours required prior to admission to degree candidacy (if approved as part of the degree program) may be counted in residence, but in no case may the period of residence aggregate less than 30 weeks. For regulations governing military students who are transferred when they are within 6 semester hours of their degree, see page 31.

Transfers.—Transfer students from other universities who have partially or substantially met the major requirements are required to complete satisfactorily 12 semester hours of approved work in the major field in the College of General Studies. This work will count as part of the minimum (30 semester hours) residence requirement. (For regulations concerning transfer within the University, see page 29.)

Scholarship

The system of grading and computing scholarship is described in detail on page 27. For regulations concerning probation, suspension, and readmission, see page 28.

To remain in good standing, a student must maintain a general quality-point index of 2.00 and a quality-point index of at least 2.50 in his major.

Curriculum

In addition to the requirements for the degree of Associate in Arts, the satisfactory completion of 60 semester hours, as set forth in one of the following curricula, is required.

GENERAL CURRICULUM

Preregistration counseling is recommended to adapt this curriculum to the student's objectives or employment responsibilities and aims. For appointments call the College of General Studies, FEderal 8-0250, Extension 441.

Students planning to work toward a Master's degree in Columbian College, the School of Government, or the School of Education are advised to plan their programs of study toward the Bachelor's degree so that they will meet the prerequisite requirements of the school or college of their choice.

Candidates for the degree of Bachelor of Arts registered in the General Curriculum select courses, approved by the Dean or Assistant Dean, from two of the following divisions, one of which constitutes the major and the other the minor.

Faculty Adviser: Walter Harold Hayes, Jr., A.M., Assistant Dean in the College of General Studies. Building F, Room 12 (706 Twentieth Street NW.), FEderal 8-0250, Extension 487 or 441

1. *The Division of Languages and Literatures.*—The departments of Classical Languages and Literatures, English, Germanic Languages and Literatures, Journalism, Romance Languages and Literatures, and Slavic Languages and Literatures.
2. *The Division of Mathematics and Physical Sciences.*—The departments of Chemistry, Geology, Mathematics, Physics, and Statistics.
3. *The Division of the Natural Sciences.*—The departments of Bacteriology, Biology, Botany, Physiology, Psychology, and Zoology.
4. *The Division of the Social Sciences.*—The departments of Accounting, Business and Public Administration, Economics, Education, Geography, History, Philosophy, Political Science, Religion, Sociology and Anthropology, and Speech.

Semester
Hours

Major division	24
(Courses are to be selected, with the approval of the adviser, from appropriate fields of study listed in the student's major division. Eighteen of the required 24 hours must be in courses with departmental numbers above 100.)	
Minor division	12
(Courses are to be selected, with the approval of the adviser, from appropriate fields of study listed in the student's minor division.)	
Electives	24
Total (of which at least 30 semester hours must be in courses with departmental numbers above 100)	60

BUSINESS ADMINISTRATION CURRICULUM

Faculty Adviser: James Carlton Dockeray, Ph.D., Professor of Finance and Executive Officer of the Department. Building Y, Room 13 (802 Twenty-first Street NW.), FEderal 8-0250, Extension 512

Semester
Hours

Accounting 193: Business Budgeting	3
Business Administration 101: Business Organization and Combination....	3
Business Administration 102: Fundamentals of Management.....	3
Business Administration 105: Personnel Management	3
Business Administration 131: Business Finance	3
Business Administration 141: Principles of Marketing.....	3
Business Administration 161: Commercial Law: Contracts, Sales, Agency, and Bailments	3
Business Administration 162: Commercial Law: Negotiable Instruments, Property, Mortgages	3
Business Administration 198: Case Problems in Management.....	3
Economics 121: Money and Banking.....	3
Group Option.... (To be selected from one of the following groups).....	15
Electives	15
Total.....	60

† *Group Option.*—The selection of the option and the courses (15 semester hours) to be taken in it must be made in consultation with the faculty adviser.

* To be selected in consultation with the Executive Officer of the Department of Business and Public Administration.

† Lists of courses suggested for each option may be obtained from the Assistant Dean of the College of General Studies or the Executive officer of the Department of Business and Public Administration.

Normally no more than 6 semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained if the student wishes such modification of his option group.

Group I—General Business

This group option is made up of selected courses offered by the departments of Accounting, Business and Public Administration, Economics, and Statistics.

Group II—Personnel Management

This group option is made up of selected courses offered by the departments of Business and Public Administration, Economics, Psychology, Speech, and Statistics.

Group III—Finance

This group option is made up of selected courses offered by the departments of Accounting, Business and Public Administration, Economics, Political Science, and Statistics.

Group IV—Marketing

This group option is made up of selected courses offered by the departments of Business and Public Administration, Economics, Geography, and Statistics.

Group V—Controllershship

This group option is made up of selected courses offered by the departments of Accounting, Business and Public Administration, and Economics.

Group VI—Economics

This group option is made up of selected courses offered by the departments of Economics and Business and Public Administration.

Group VII—Statistics

This group option is made up of selected courses offered by the Department of Statistics.

Group VIII—Transportation and Public Utilities

This group option is made up of selected courses offered by the departments of Business and Public Administration, Economics, Geography, History, and Statistics.

Foreign Commerce.—Business Administration majors who wish to specialize in foreign commerce may request a modification of the above requirements. The modified major excludes some of the above required courses and adds others, such as a third year of foreign language, foreign markets, exporting and importing, economic geography, and other courses relating to overseas trade. Each program must be approved by the adviser.

DEPARTMENTAL MAJOR

Students who elect a major of the type offered in Columbian College and the School of Government should consult the University catalogue for the major requirements. Any deviation from these major requirements must be approved by the Executive Officer of the department concerned and the Dean of the College of General Studies.

BACHELOR OF SCIENCE IN CARTOGRAPHY

The College of General Studies offers a four-year curriculum designed to prepare students for the degree of Bachelor of Science in Cartography.

ENTRANCE REQUIREMENTS

The entrance requirements are the same as those stated on pages 21-23, with the exceptions noted below under "Advanced Standing".

Advanced Standing

Twenty-four semester hours of credit may be granted upon the successful completion of validating examinations. No credit will be given for GED tests, correspondence schools, or service school courses.

REQUIREMENTS FOR THE DEGREE

The residence and scholarship requirements for the degree of Bachelor of Science in Cartography are the same as those stated above for the degree of Bachelor of Arts.

Curriculum

To be recommended by the faculty for graduation, candidates for the degree of Bachelor of Science in Cartography are required to complete the following curriculum of 126 semester hours.

Faculty Adviser: Harland Walter Westermann, Ph.D., Associate Professor of Geography. Building I, Room 301 (2135 G Street, NW.), Federal 8-0250, Extension 287 or 298

	Semester Hours
Cartography 1: Map Interpretation	3
Cartography 2: Photo Interpretation	3
Cartography 11: Cartographic Drafting and Descriptive Geometry..	3
Cartography 12: Topographic Surveying	3
Cartography 13: Higher Surveying	3
Cartography 17-18: Elementary Photogrammetry	6
Cartography 110: Map Projections	2
Cartography 111: Map Reproduction	1
Cartography 155: Elements of Geodesy	3
Cartography 156: Geodetic Astronomy	3
Cartography 191-92: Map and Chart Construction.....	6
Electrical Engineering 11: Electric Circuits	3
Electrical Engineering 102: Engineering Electronics	3
English 1: English Composition	3
English 2: English Composition	3
English 11: The Writing of Reports.....	3
Geography 51: Introduction to Geography	3
Geography 113: Geomorphology	3
Geography 114: Weather and Climate	3
Geography 132: Land Use	3
Geography 176: Photo Geography	3
Geology 105-6: Fundamentals of Geophysics.....	6
Mathematics 12: Analytic Geometry	3
Mathematics 29: Calculus I	3
Mathematics 30: Calculus II	3
Mathematics 31: Calculus III	3
Mathematics 111: Mathematics for Engineers and Physicists I....	3
Mathematics 112: Mathematics for Engineers and Physicists II....	3
Physics 11: Introductory Physics	3
Physics 14: General Physics	3

	Semester Hours
Physics 15: General Physics	3
Social Studies: (any two of the following two-semester courses)	12
Economics 1-2: Principles of Economics (3-3)	
History 39-40: The Development of European Civilization (3-3)	
History 71-72: The Development of the Civilization of the United States (3-3)	
Political Science 9-10: Government of the United States (3-3)	
Sociology and Anthropology 1-2: Man in Modern Society (3-3)	
Statistics 91: Principles of Statistical Methods	3
Statistics 106: Factor Analysis	3
Electives	9
Total	126

THE DEGREE OF MASTER OF ARTS

Master of Arts curricula in the fields of Controllershship, Governmental Administration, and Personnel Management are offered for adults with successful work experience who find it essential to take most of their graduate studies off-campus. This program is available in the Main Navy Building, the Pentagon, and Fort Monroe and will be offered elsewhere as the demand warrants. Additional curricula will be established when the need becomes apparent.

All the work in these three curricula may be taken off-campus. If it should become necessary, up to 50 per cent of the courses may be taken on campus. In all cases the University standards for graduate study are maintained.

Graduate students who plan to work toward Master's degrees in another school or college of the University may enroll for graduate courses in the Off-Campus Division, with the approval of the dean of the school or college in which they are enrolled. In the School of Government and the School of Education, a maximum of 6 hours of approved off-campus work will be accepted at the time of matriculation for the degree and 6 additional hours of approved courses will be permitted off-campus after matriculation.

COUNSELING SERVICE

An advisory service, which is the joint responsibility of the agency sponsoring the program and the University, is available to all Master of Arts candidates. Regular members of the Faculty of the University are available as curriculum advisers in the various specialized fields.

REQUIREMENTS FOR ADMISSION TO DEGREE CANDIDACY

To be admitted to degree candidacy the applicant must have (1) an approved Bachelor's degree (120 semester hours, which conform essentially to the requirements for a Bachelor's degree in the College of Gen-

eral Studies) from an accredited higher institution; (2) credit (totaling 6 semester hours), with the grade of *B* (undergraduate) or *S* (graduate), for two courses approved by the academic adviser and taken in the College of General Studies prior to admission to candidacy; and (3) a quality-point index of 3.00 (*B*) in the undergraduate major. If the applicant's work history gives evidence of more competence than his previous academic record indicates, he may be admitted to candidacy on the basis of satisfactory completion of 12 semester hours of work approved by his academic adviser, acceptable results of scholastic aptitude tests, or both.

ADVANCED STANDING

A maximum of 6 semester hours of advanced standing may be credited toward the degree by transfer of credit for approved graduate work taken at an accredited college or university.

REQUIREMENTS FOR THE DEGREE

RESIDENCE

Of the 30 semester hours of graduate work required for the degree, a minimum of 24, which may include the thesis (6 semester hours), must be completed while registered as a degree candidate in the College of General Studies, except in the case of transfers within the University, who are required to have 12 hours of residence in the College of General Studies as degree candidates.

SCHOLARSHIP

The grade of at least *S* (satisfactory) in all courses is required. A student whose scholarship is unsatisfactory may be suspended by the Dean upon recommendation of the faculty adviser and the approval of the Committee on Scholarship. A Master's candidate who accumulates 9 semester hours or more of *U* (unsatisfactory) (including grades of *C* or lower in the prerequisite courses) will be automatically suspended. For information concerning the system of grading, see page 27.

THESIS

With the approval of the adviser, a thesis may be substituted for six hours of elective credit. (See page 31.)

The thesis subject must be approved by the director of the thesis and the faculty adviser and presented to the Dean no later than the date announced in the calendar.

The thesis in its final form must be approved by the director of the thesis and the faculty adviser and presented to the Dean no later than the date announced in the calendar. Printed copies of detailed regula-

tions regarding the form and reproduction of the thesis are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If preparation of the thesis extends beyond the two-year period the student must register for it again and pay tuition on the same basis as for a repeated course.

COURSE SUBSTITUTION

It is the responsibility of the student to get from the faculty adviser and the Dean the written approval required for course substitutions in any of the Master's curricula. Forms for requesting course substitution are available at the College of General Studies.

COMPREHENSIVE EXAMINATIONS

The Master's candidate is required to pass a written Comprehensive Examination. The examinations are conducted at the University twice each year: December 1 and 2 for students graduating in February; and March 31 and April 1 for students graduating in June and October. At the time of the examination he may be required to submit to the examination committee copies of articles published, pertinent staff studies, reports, etc., prepared during the period of graduate study, as additional evidence of Master of Arts competency.

CURRICULA

Controllership

Faculty Adviser: Arlin Rex Johnson, Ph.D., Professor of Business Administration. Hall of Government, Room 206, FEDERAL 8-0250, Extension 493

A. Prerequisites

In addition to the general requirements for admission to candidacy for the degree of Master of Arts, candidates are expected to have an undergraduate background in the social sciences. Students lacking this academic background may, with the approval of the adviser, substitute work experience. At least one approved course in each of the following fields is required: Accounting, Business and Public Administration, Economics, and Political Science. Additional course work may be prescribed.

B. Required Courses

Semester
Hours

Accounting 211-12: Managerial Accounting	6
Business Administration 261: Seminar in Advanced Management...	3
Business Administration 268: Management Engineering	3
Business Administration 296: Seminar in Controllershship.....	3
Psychology 145: Principles of Human Relations.....	3
Public Administration 213: Administration in Government.....	3
Public Administration 251: Governmental Budgeting	3
Public Administration 252: Seminar in Planning and Programming..	3
Statistics 101: Basic Principles of Statistical Methods I.....	3
Total.....	30

C. Electives

A student whose previous academic preparation makes it unnecessary for him to take all the prescribed courses in this program may substitute elective courses, with the written approval of his faculty adviser. Electives may be selected from the Governmental Administration or the Personnel Management Master's program. In exceptional cases, the faculty adviser may approve other courses as electives. Also included among the possible electives is Business Administration 299-300: Thesis*

6

Governmental Administration

Faculty Adviser: David Springer Brown, Ph.D., Professor of Public Administration. Hall of Government, Room 205; FEderal 8-0250, Extension 404 or 540.

A. Prerequisites

In addition to the general requirements for admission to candidacy for the degree of Master of Arts, candidates are expected to have an undergraduate background in the social sciences or business administration. Students lacking this academic background may, with the approval of the adviser, substitute work experience. At least one approved course in each of the following fields is required: Business and Public Administration, Political Science, Economics, and Psychology. Additional course work may be prescribed.

B. Required Courses

Semester
Hours

Business Administration 268: Management Engineering	3
Psychology 146: Problems in Human Relations.....	3
Public Administration 210: The Management Function.....	3
Public Administration 213: Administration in Government.....	3

* Business Administration 299 is a thesis seminar offered only on campus.

	Semester Hours
Public Administration 231: Public Personnel Management.....	3
Public Administration 237: Intermediate Management and Supervision	3
Public Administration 251: Governmental Budgeting	3
Public Administration 252: Seminar in Planning and Programming..	3
Public Administration 260: Seminar in Policy Formulation and Ad- ministration	3
Elective	3
Total.....	30

C. Electives

In addition to the elective of 3 semester hours listed above, a student whose previous academic preparation makes it unnecessary for him to take all the prescribed courses in this program may substitute elective courses, with the written approval of his faculty adviser. Electives may be selected from the courses listed under the Controllorship and Personnel Management Master's programs. In exceptional cases, the faculty adviser may approve other courses as electives. Also included among the possible electives is Public Administration 299-300: Thesis*..... 6

Personnel Management

Faculty Adviser: James Norman Mosél, A.M., Associate Professor of Psychology. Monroe Hall, Room 429, FEderal 8-0250, Extension 462

A. Prerequisites

In addition to the general requirements for admission to candidacy for the degree of Master of Arts, candidates are expected to have an undergraduate background in the social sciences. Students lacking this academic background may, with the approval of the adviser, substitute work experience. At least one approved course in each of the following fields is required: Economics, Political Science, Psychology, and Statistics. Additional course work may be prescribed.

B. Required Courses

	Semester Hours
Psychology 144: Personnel Psychology	3
Psychology 246: Seminar: Personnel Measurement Techniques (Pre- requisite: Psychology 144, and an elementary course in Statistics) ..	3
Public Administration 213: Administration in Government.....	3
Public Administration 231: Public Personnel Management.....	3
Public Administration 232: Personnel Procedures and Problems.....	3
Public Administration 237: Intermediate Management and Supervision	12
Electives	3
Total.....	30

* Public Administration 299 is a thesis seminar offered only on campus.

C. Electives

Electives should be selected after consultation with the faculty adviser. They should be selected from such courses as the following, which will be provided off-campus according to the polled interests of the students:

Semester
Hours

Business Administration 286: Management in the Armed Forces.....	3
Economics 241: Labor Economics	3
Economics 244: Collective Bargaining	3
Psychology 127: Employee Counseling	3
Psychology 146: Problems in Human Relations.....	3
Psychology 245: Seminar: Employee Motivation and Morale.....	3
Psychology 247: Applications of Behavioral Research Methods to Personnel Management	3
Public Administration 233: Seminar in Manpower Development and Utilization	3
Public Administration 251: Governmental Budgeting	3
Public Administration 260: Seminar in Policy Formulation and Administration	3
Speech 121: Group Discussion and Conference Leadership.....	3
Also one of the following courses may be used as an elective depending on the interest and background of the candidate:	
Business Administration 299-300: Thesis*	6
Psychology 299-300: Thesis	6
Public Administration 299-300: Thesis*	6

OFF-CAMPUS CENTERS

The College of General Studies, through its Off-Campus Division, has offered programs in the various governmental and Armed Forces Installations listed below.

CIVIL SERVICE COMMISSION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: William A. Hammill, Director of Personnel; Richard Post, Personnel Management Supervisor
 Building: Main Building, 8th and F Streets NW., Room 223 (Mr. Hammill); Room 227 (Mr. Post)
 Telephone: DUnkirk 6-3484 (Mr. Hammill); DUnkirk 6-5488 (Mr. Post)

Coordinator for the University: Alexander G. Rose III
 Telephone: Federal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

* Business Administration 299 and Public Administration 299 are thesis seminars offered only on campus.

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Civil Service Commission and to personnel of other government agencies by permission

DEPARTMENT OF COMMERCE

BUREAU OF THE CENSUS, WASHINGTON 25, D. C.

Training Officers: John Vawter, Chief, Personnel Standards and Development Branch, Personnel Division; Mrs. Dorothy Paul Pritzker, Training Officer (General Field), Personnel Division

Building: FOB 3, Room 1370, Suitland, Maryland

Telephone: LUdlow 4-3000, Extension 525

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate courses leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to all employees of the Bureau of the Census and the Naval Hydrographic Office, and to other government employees by permission

BUREAU OF FOREIGN COMMERCE, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Donald O. Hayes, Career Development Officer; Mrs. Jane deLauder, Assistant Career Development Officer

Building: Commerce Department Building, Room 1067, 14th Street and Constitution Avenue NW.

Telephone: STerling 3-9200, Extension 3506 (Mr. Hayes); Extension 4233 (Mrs. deLauder)

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of Commerce and to personnel of other government agencies by permission

BUSINESS AND DEFENSE SERVICES ADMINISTRATION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: John E. Taylor, Chief, Employment Branch; Mrs. Della A. Young, Training Adviser

Building: Commerce Department Building, Room 4845, 14th Street and Constitution Avenue NW.

Telephone: STerling 3-9200, Extension 3948 (Mr. Taylor); Extension 4012 (Mrs. Young)

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of Commerce and to personnel of other government agencies by permission

COAST AND GEODETIC SURVEY, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Mrs. Muriel Christgau, Training Branch, Personnel and Safety Division; Mr. Robert C. Czapiewski, Employee Development Officer

Building: Commerce Department Building, Room 2204, 14th Street and Constitution Avenue NW.

Telephone: STerling 3-9200, Extension 2292

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate courses leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science in Cartography

Length of Courses: Fifteen weeks

Open to all employees of the Bureau of the Census and the Naval Hydrographic Office, and to other government employees by permission

NATIONAL BUREAU OF STANDARDS, WASHINGTON 25, D. C.

Registrar: Mrs. Leila L. Chapin

Building: The Manse, Room 102, Connecticut Avenue and VanNess Street NW.

Telephone: EMerson 2-4040, Extension 366 or 7400

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to all employees of the National Bureau of Standards—also to all employees of other government agencies and to all American citizens, providing they meet the formal prerequisites

PATENT OFFICE, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Willis Hokans, Employee Development Officer
 Building: Commerce Department Building, Room 3625, 14th Street
 and Constitution Avenue NW.

Telephone: STerling 3-9200, Extension 2871

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees
 of Associate in Arts and Bachelor of Arts; graduate program leading
 to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of Com-
 merce and to personnel of other government agencies by permission

WEATHER BUREAU, WASHINGTON 25, D. C.

Training Officer: Albert V. Carlin, Chief, Training Section
 Building: Main Administration Building, Room 108, 24th and M
 Streets NW.

Telephone: ADams 2-3200, Extension 285

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Graduate courses in meteorology

Length of Courses: Fifteen weeks

Open to all government employees by permission of the Weather
 Bureau

DEPARTMENT OF DEFENSE

THE PENTAGON, WASHINGTON 25, D. C.

After-hours Training Program: John G. Boswell, Coordinator for the
 University

Room: Reception center on the Concourse

Telephone: OXford 7-3141 or FEderal 8-0250, Extension 487, 441

Type of Course Offered: Undergraduate courses leading to the degrees
 of Associate in Arts and Bachelor of Arts; graduate program leading
 to the degree of Master of Arts in the fields of Controllershship, Gov-
 ernmental Administration, and Personnel Management

Length of Courses: Fifteen weeks in Fall and Spring semesters; eight
 weeks in the Summer Sessions. Restricted to military and civilian
 personnel of the Department of Defense

DEPARTMENT OF THE AIR FORCE
Langley Air Force Base, Virginia

Educational Consultant: Robert J. Dewey
Building: T-238
Telephone: PARk 2-7911, Extension 24120
Coordinator for the University: John G. Boswell
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Undergraduate program leading to the degrees
of Associate in Arts and Bachelor of Arts
Length of Courses: Eight weeks
Open to military and civilian employees of the Air Force and to other
government employees, by permission of the Commanding Officer of
Langley Air Force Base

DEPARTMENT OF THE ARMY
Army Map Service, Washington 25, D. C.

Training Officer: Jerome E. McClain
Building: Erskine Hall, 6500 Brooks Lane NW.
Telephone: OLiver 4-4350, Extension 587
Coordinator for the University: John G. Boswell
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Special courses for in-service training program
Length of Courses: Fifteen weeks
Restricted to personnel of the Army Map Service

Army Security Agency, Arlington, Virginia

Educational Adviser: Raymond Brogan
Building: T-300
Telephone: JACkson 5-5800, Extension 772
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees
of Associate in Arts and Bachelor of Arts
Length of Courses: Eight and fifteen weeks
Open to employees of the Army Security Agency

Fort Belvoir, Virginia

Educational Adviser: Emmerick Eber
Building: B-2
Telephone: EDgewater 9-5500, Extension 27154
Coordinator for the University: John G. Boswell
Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science in Cartography; and courses leading to the degree of Master of Engineering Administration in the School of Engineering of the University

Length of Courses: Eight and fifteen weeks

Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Belvoir

Fort McNair, Washington 25, D. C.

Educational Adviser: Miss Margaret Lockwood

Building: Post Education Center, Building 20A, Second Floor

Telephone: JACKSON 7-9400, Extension 268.

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Eight and fifteen weeks

Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort McNair

Fort Monroe, Virginia

Educational Consultant: Robert J. Dewey

Educational Adviser: Paul Rahenkamp

Buildings: T-238, Langley Air Force Base (Mr. Dewey)

Education Center, Fort Monroe (Mr. Rahenkamp)

Telephone: PARK 2-7972, Extension 24120 (Mr. Dewey)

Hampton 7972, Extension 22254 (Mr. Rahenkamp)

Coordinator for the University: John G. Boswell

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts in the field of Personnel Management

Length of Courses: Eight weeks

Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Monroe

Fort Myer, Virginia

Educational Adviser: Miss Margaret Lockwood

Building: Post Education Center, Building 604, South Area

Telephone: JACKSON 7-9400, Extension 268

Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Eight and fifteen weeks
Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Myer

DEPARTMENT OF THE NAVY

Main Navy Building, Washington 25, D. C.

Training Officers: George D. Thomas, Head, Training Branch, DCPD; Edward Goemaat, Head, Professional and Academic Programs Section; Miss Kathleen V. Sullivan, Training Specialist
Building: Main Navy Building, Room 1111, Constitution Avenue at 18th Street NW.

Telephone: OXford 6-6155
After-hours Training Program: John A. Timour, Coordinator for the University
Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate courses leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts in the fields of Controllershship, Governmental Administration, and Personnel Management; and courses leading to the degree of Master of Engineering Administration in the School of Engineering of the University
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Department of Defense

Bureau of Naval Personnel, Washington 25, D. C.

Training Officers: Cmdr. P. S. Smith, Head, Officer Education and Training Branch; DeWitt Fisher, Deputy Head; Paul L. Frantz, Special Programs Coordinator
Building: Arlington Annex, Room 3713
Telephone: OXford 4-2403 or 4-2776

Coordinator for the University: John A. Timour
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Special courses in Human Relations and Management, Public Speaking for Naval Personnel, and Foreign Languages.

Length of Courses: Fifteen weeks
Open to military personnel on active duty in the Department of the Navy by quota assigned to the various bureaus and offices, and to civilian employees of the Department by permission

Bureau of Ships, Washington 25, D. C.

Training Officer: Mrs. Edna K. Trudeau, Employee Development Officer
Building: Main Navy Building, Room 2438, Constitution Avenue at
18th Street NW.
Telephone: OXford 6-2927

Coordinator for the University: John A. Timour
Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Graduate program leading to the Master of Arts degree in the fields of Controllershship, Governmental Administration, and Personnel Management; and courses leading to the degree of Master of Engineering Administration in the School of Engineering of the University

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Department of Defense

Bureau of Naval Weapons, Washington 25, D. C.

Training Officers: S. P. Dudzik, Head, Employee Training and Development Section; Mrs. Honorah B. Peter, Training Officer
Building: Munitions Building, Room 2122, Constitution Avenue at 20th Street NW.
Telephone: OXford 6-7341

Coordinator for the University: John A. Timour
Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Special courses in Human Relations and Management

Length of courses: Fifteen weeks

Open to civilian and military personnel on active duty in the Bureau of Naval Weapons by quota assigned to the various divisions and offices, and to civilian employees of the Department of the Navy by permission

Bureau of Yards and Docks, Washington 25, D. C.

Training Officers: Robert J. Wilson, Head, Training Section; E. R. Settle, Training Officer
Building: Yards and Docks Annex, Room 2-A-72, Memorial Drive and H Road, Arlington, Virginia
Telephone: OXford 5-4367

Coordinator for the University: John A. Timour
Telephone: FEderal 8-0250, Extension 488

Type of Courses: Graduate program leading to the degree of Master of Arts in the fields of Controllershship, Governmental Administration, and Personnel Management; and courses leading to the degree of

Master of Engineering Administration in the School of Engineering
of the University

David Taylor Model Basin, Carderock, Maryland

Training Officer: William H. Struhs, Jr., Head, Training Branch
Building: 13, Room 202

Telephone: EMpire 5-2600, Extension 394

Coordinator for the University: John A. Timour

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Special in-service training courses arranged
by the Training Officer

Length of Courses: Fifteen weeks

Open to military personnel and civilian employees of the David Taylor
Model Basin and to other government employees, by permission of
the Commanding Officer of the installation

Military Sea Transportation Service, Washington 25, D. C.

Training Officers: Maurice V. Foreman, Director, Training Division;
John J. Bean, Assistant Director

Building: T-8, Room 1217, 3800 Newark Street NW.

Telephone: OXford 6-9620

After-hours Training Program: John A. Timour, Coordinator for the
University

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Graduate and Special Courses in Management

Length of Courses: Fifteen weeks

Open to civilian and military personnel of the Military Sea Transpor-
tation Service and to other government employees, by permission of the
Commanding Officer of the installation

National Naval Medical Center, Bethesda, Maryland

Information and Education Officer: Lt. Carol J. MacLean, USNR

Building: 102, Information and Education Office

Telephone: OLiver 4-2500, Extension 585

Coordinator for the University: John A. Timour

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees
of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy, employees of the
National Institutes of Health, and to other government employees,
by permission of the Commanding Officer of the National Naval Med-
ical Center

Naval Air Station, Anacostia, Washington 25, D. C.

Information and Education Officer: Lt. (j.g.) Richard D. Godown,
USNR

Building: Administration Building

Telephone: LUdlow 4-2400, Extension 321

Type of Course Offered: Undergraduate program leading to the degrees
of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy and to other em-
ployees of the Department of Defense, by permission of the Command-
ing Officer of the Naval Air Station

Naval Air Test Center, Patuxent River, Maryland

Information and Education Officer: Ensign Anne H. Baumhofer, USNR

Building 410, Information and Education Center

Telephone: VOLunteer 3-3111, Extension 524 or 595

Coordinator for the University: John A. Timour

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees
of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy and to other
government employees and civilians, by permission of the Command-
ing Officer of the Naval Air Test Center

Naval Engineering Experiment Station, Annapolis, Maryland

Training Officer: Theodore Stein

Building: 3-A, Administration Building, Industrial Relations Depart-
ment

Telephone: COLonial 3-2611, Extension 1210

Coordinator for the University: John A. Timour

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Courses in undergraduate program leading to
the degrees of Associate in Arts, Associate in Science, and Bachelor of
Arts; pre-engineering courses and graduate courses

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy and to other gov-
ernment employees and civilians, by permission of the Commanding
Officer of the Engineering Experiment Station

Naval Hydrographic Office, Suitland, Maryland

Training Officers: Lester S. Hottle, Supervisory Employee Development
Officer; Paul F. Murphy, Employee Development Officer

Building: FOB 3, Room G-121

Telephone: REdwood 6-2700, Extension 248
Coordinator for the University: John A. Timour
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts, Bachelor of Arts, and the Bachelor of Science in Cartography
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Navy, employees of the Census Bureau, and to other government employees in the Department of Defense, by permission of the Naval Hydrographic Office

Naval Propellant Plant, Indian Head, Maryland

Training Officer: Edward Wise
Building: D-325, Industrial Relations Office
Telephone: RIverside 3-2111, Extension 591
Coordinator for the University: John A. Timour
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; and graduate courses
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Navy and to other government employees and civilians, by permission of the Commanding Officer of Naval Propellant Plant

Naval Research Laboratory, Washington 25, D. C.

Training Officers: Paul J. Dunn; William J. McLaughlin, Staff Training Section
Building: 43, Rooms 102 and 111, 4555 Overlook Avenue SW.
Telephone: JOhnson 3-6600, Extension 856 and 858
Coordinator for the University: John A. Timour
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate program leading to the degree of Associate in Science
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Navy at the Naval Research Laboratory and other government employees, by permission of the Naval Research Laboratory

Naval Supply Center, Norfolk, Virginia

Training Officers: Ernest A. Morgan; Harold V. Pelton, Assistant Director of Training
Building: W-143
Telephone: MADison 2-8211, Extension 2144

Coordinator for the University: John G. Boswell

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Graduate program leading to the degree of Master of Arts in the fields of Governmental Administration and Personnel Management

Naval Weapons Laboratory, Dahlgren, Virginia

Training Officer: Donald E. Voekler, Senior Training Officer

Building: Industrial Relations Building

Telephone: NOth 3-2511, Extension 609

Coordinator for the University: John A. Timour

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate and graduate courses in Physics

Length of Courses: Fifteen weeks

Open to civilian and military personnel of the Department of Defense and others, by permission of the Commanding Officer of the installation

Naval Weapons Plant, Washington 25, D. C.

Training Officers: Charles A. Trainum, Supervisory Training Officer;

Mrs. Agnes Bryan, Training Officer

Building: 172, Second Floor, M at 8th Street SE.

Telephone: LIncoln 7-5700, Extension 2160, 2188, or 2416

Coordinator for the University: John A. Timour

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate courses in accounting, administration, and personnel management; special certificate program for supervisors to meet local in-service training needs

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy and to other government employees, by permission of the Superintendent of the Naval Weapons Plant

United States Marine Corps Schools, Quantico, Virginia

Education Officer: Lt. Anne-Marie Connors, USMC

Building: Special Services Building, Education Office, Larson Gymnasium

Telephone: Quantico 1000, Extension 26749

Coordinator for the University: John A. Timour

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Eight and fifteen weeks
Open to military personnel and their dependents and civilian personnel
attached to the Marine Corps Schools

DEPARTMENT OF JUSTICE, WASHINGTON 25, D. C.
(Member of Federal Triangle Educational Association)

Training Officer: Daniel Keenan, Departmental Training Officer
Building: Justice Department Building, Room 1226, 10th Street and
Pennsylvania Avenue NW.
Telephone: REpublic 7-8200, Extension 3124

Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees
of Associate in Arts and Bachelor of Arts; graduate program leading
to the degree of Master of Arts

Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of Justice
and to personnel of other government agencies by permission

FEDERAL BUREAU OF INVESTIGATION, WASHINGTON 25, D. C.

Special Agent: William E. Clark, Personnel Office
Building: Justice Department Building, Room 4513, 9th Street and
Pennsylvania Avenue NW.
Telephone: EXecutive 3-7100, Extension 402

Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees
of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks
Open to employees of the Federal Bureau of Investigation only

DEPARTMENT OF LABOR, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: James C. Stevens, Employee Development Officer;
Kenneth Bute, Assistant Training Officer
Building: Labor Department Building, Room 7411, 14th Street and
Constitution Avenue NW.
Telephone: EXecutive 3-2420, Extensions 2101 and 2102

Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees
of Associate in Arts and Bachelor of Arts; graduate program leading
to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of Labor and to personnel of other government agencies by permission

DEPARTMENT OF STATE, WASHINGTON 25, D. C.

Training Officer: Mel H. Bolster, Chief, Career Development Section;
Departmental Placement and Career Development Branch, Office of
Personnel

Building: State Department Building, 23d Street between Virginia Avenue and C Street NW.

Telephone: DUDley 3-6288

Coordinator for the University: John A. Timour

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Special courses designed for employees self-development

Length of Courses, Fifteen weeks

Open to employees of the Department of State, I. C. A., and U. S. I. A.

DEPARTMENT OF THE TREASURY, WASHINGTON 25, D. C.

BUREAU OF ACCOUNTS

(Member of Federal Triangle Educational Association)

Training Officers: James T. Diffin, Training Assistant; Thomas Kerr,
Assistant Training Assistant

Building: Treasury Annex Number 1, Room 242, Pennsylvania Avenue and Madison Place NW.

Telephone: WORTH 4-2628

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

BUREAU OF CUSTOMS, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: James J. Doherty, Employee Development Officer

Building: Internal Revenue Building, Room 7561, 12th Street and Constitution Avenue NW.

Telephone: WORTH 4-4060

Coordinator for the University: Alexander G. Rose III
Telephone: Federal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

BUREAU OF ENGRAVING AND PRINTING, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Mrs. Frances N. Nadeau, Employee Development Officer
Building: Annex Building, Rooms 106-7, 14th and C Streets NW.
Telephone: WORTH 4-7571

Coordinator for the University: Alexander G. Rose III
Telephone: Federal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

BUREAU OF NARCOTICS, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: John D. Erwin, Narcotic Agent
Building: Coast Guard Building, Room 8107, 1300 E Street NW.
Telephone: WORTH 4-2870

Coordinator for the University: Alexander G. Rose III
Telephone: Federal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

COAST GUARD, WASHINGTON 25, D. C.

Training Officers: Jasper L. Kranke, Supervisory Training Officer; C. Howard Larson, Training Assistant
Building: U. S. Coast Guard Building, Room 4211, 1300 E Street NW.
Telephone: WORTH 4-5350

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Coast Guard and to personnel of other government agencies by permission

INTERNAL REVENUE SERVICE, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Miss Ethel W. Morgan, Assistant Chief, Training Branch; Miss Ruby Bennett, Training Officer

Building: Internal Revenue Service Building, Room 3700, 12th Street and Constitution Avenue NW.

Telephone: WOrth 4-3377 (Miss Morgan); WOrth 4-3931 (Miss Bennett)

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

DISTRICT OF COLUMBIA GOVERNMENT, WASHINGTON, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Benjamin Ludwig, Training Officer; Charles Stamps, Assistant Training Officer

Building: District of Columbia Government Building, Room 209, 499 Pennsylvania Avenue NW.

Telephone: NAtional 8-6000, Extension 2270

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the District of Columbia Government and to personnel of other Federal Government agencies by permission

DEPARTMENT OF PUBLIC WELFARE

Children's Center, Laurel, Maryland

Training Officer: William R. Perl, Chief Psychologist

Building: Administration Building

Telephone: NAtional 8-1496

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Special courses in Psychology

Length of courses: Fifteen weeks

Open to personnel of the Children's Center and to personnel of other

District and Federal Government agencies by permission

District of Columbia General Hospital

Training Assistant: Mrs. Henrietta M. Canby

Building: Administration Annex, District of Columbia General Hos-
pital, 19th and E Streets SE.

Telephone: LIncoln 7-9200, Extension 341

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate courses in Psychology

Length of Course: Fifteen weeks

Open to all employees of District of Columbia General Hospital

FEDERAL AVIATION AGENCY, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: H. C. Rose, Chief; A. Eric Bubeck, Deputy Chief,

Management and Training Development Branch; E. A. Woody,
Chief, Management and Training Section

Building: T-5, Room 2714, 16th Street and Constitution Avenue NW.

Telephone: STerling 3-9200, Extension 2340

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees
of Associate in Arts and Bachelor of Arts; graduate program leading
to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Federal Aviation Agency
and to personnel of other government agencies by permission

FEDERAL COMMUNICATIONS COMMISSION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Mrs. Pauline M. Foster, Assistant Personnel Officer

Building: New Post Office Building, Room 1207, 12th Street and Penn-
sylvania Avenue NW.

Telephone: EXecutive 3-3620, Extension 134

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Federal Communications Commission and to personnel of other government agencies by permission

FEDERAL RESERVE BOARD, WASHINGTON 25, D. C.

Training Officer: Miss June E. Ayers, Administrative Assistant
Building: Federal Reserve Building, 20th Street and Constitution Avenue NW.

Telephone: REpublic 7-1100, Extension 435

Coordinator for the University: John A. Timour

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate and graduate courses leading to the degrees of Associate in Arts, Bachelor of Arts, and Master of Arts

Length of Courses: Fifteen weeks

Open to all government employees and others by permission

INTERSTATE COMMERCE COMMISSION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: William Bateman, Training Officer; Dyrk Van Duijl, Assistant Training Officer

Building: Interstate Commerce Building, Room 1148, 12th Street and Constitution Avenue NW.

Telephone: NAtional 8-7460, Extension 3107

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Interstate Commerce Commission and to personnel of other government agencies by permission

NATIONAL SCIENCE FOUNDATION, WASHINGTON 25, D. C.

Training Officer: James R. Keene

Building: National Science Foundation Building, 19th Street and Constitution Avenue NW.

Telephone: STerling 3-2140, Extension 389

Coordinator for the University: John A. Timour
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Courses leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Fifteen weeks
Open to all government employees by permission of the National Science Foundation

POST OFFICE DEPARTMENT, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: James E. Herby, J. Robert Ernst, Employee Development Officers

Building: New Post Office Building, Room 3140, 12th Street and Pennsylvania Avenue NW.

Telephone: STerling 3-3100, Extension 293

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Post Office Department and to personnel of other government agencies by permission

VETERANS ADMINISTRATION, WASHINGTON 25, D. C.

Employee Development Officer: Harry T. Bredenberg, Employee Relations and Training Division

Building: Veterans Administration, Main Building, Room 115, Vermont Avenue and H Street NW.

Telephone: EXecutive 3-4120, Extension 3102

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to employees of the Veterans Administration and to personnel of other government agencies by permission

MELPAR, INCORPORATED

FALLS CHURCH, VIRGINIA

Personnel Representative: Stephen E. Bush

Building: Central Office Building, Personnel Office, 3000 Arlington Boulevard, Falls Church, Virginia

Telephone: JEFFerson 4-6000, Extension 2181

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate and graduate courses in mathematics

Length of Courses: Fifteen weeks

Open to Melpar employees only

EDUCATION COURSES FOR TEACHERS

Undergraduate and graduate courses for elementary and secondary school teachers have been given by the College of General Studies in coordination with the School of Education in the school systems in the areas listed below. Teachers interested in having a program in Education started in their communities should make their requests known through their Directors of Instruction to Donald Thomas McNelis (FEderal 8-0250, Extension 441), Coordinator for The George Washington University of Off-Campus courses in Education.

ALEXANDRIA PUBLIC SCHOOLS

T. C. Williams, Superintendent
418 South Washington Street
Alexandria, Virginia

Telephone: KIng 9-9100

ARLINGTON COUNTY PUBLIC SCHOOLS

Joseph B. Johnson, Assistant Superintendent for Instruction
1426 N. Quincy Street
Arlington, Virginia

Telephone: JACkson 2-7700

BERKELEY COUNTY PUBLIC SCHOOLS

James L. Creasy, Superintendent of Schools
Berkeley County Public Schools
Martinsburg, West Virginia

Telephone: MArtinsburg 8978

CALVERT COUNTY PUBLIC SCHOOLS

Maurice A. Dunkle, Superintendent of Schools
Prince Frederick, Maryland

Telephone: PPrince Frederick 76 and 86

FAIRFAX COUNTY PUBLIC SCHOOLS

W. Harold Ford, Assistant Superintendent for Instruction
Fairfax County School Board
Fairfax, Virginia

Telephone: CRe scent 3-0910

FREDERICK COUNTY PUBLIC SCHOOLS

James A. Sensenbaugh, Assistant Superintendent for Instruction
115 East Church Street
Frederick, Maryland

Telephone: MOnument 2-4191

CLARKE COUNTY PUBLIC SCHOOLS

George W. Burton, Superintendent
Clarke County Public Schools
Berryville, Virginia

Telephone: Berryville 38

JEFFERSON COUNTY PUBLIC SCHOOLS

Miss Lucille Heflebower, Supervisor of Instruction
Jefferson County Public Schools
Charles Town, West Virginia

Telephone: Charles Town 64

LOUDOUN COUNTY PUBLIC SCHOOLS

Caleb J. Gibson, Director of Instruction
Mrs. Ruth D. Schulke, Supervisor, Elementary Education
Loudoun County School Board
Leesburg, Virginia

Telephone: SPring 7-2570

MONTGOMERY COUNTY PUBLIC SCHOOLS

Mrs. Helen M. Johnson, Supervisor of In-Service Education
Montgomery County School Board, Box 231
Rockville, Maryland

Telephone: POplar 2-5000

PRINCE GEORGES COUNTY PUBLIC SCHOOLS

Edward S. Beach, Jr., Administrative Assistant to the Superintendent
Prince Georges County School Board
Upper Marlboro, Maryland

Telephone: MArket 7-2811

PRINCE WILLIAM COUNTY PUBLIC SCHOOLS

Claude E. DeHaven, Assistant Superintendent for Instruction
Prince William County School Board
Manassas, Virginia

Telephone: EMpire 8-2104

ST. MARY'S COUNTY PUBLIC SCHOOLS

Robert S. King, Jr., Superintendent of Schools
St. Mary's County School Board
Washington Street
Leonardtown, Maryland

Telephone: GReenwood 5-6171

WORCESTER COUNTY PUBLIC SCHOOLS

Paul S. Hyde, Assistant Superintendent for Instruction
 Worcester County School Board
 Market Street
 Snow Hill, Maryland

Telephone: Snow Hill 582 and 583

CAMPUS DIVISION

DEGREE PROGRAM

The Campus Division is designed for promising adults with unusual backgrounds who merit the individual consideration of this Division's experimental approach to admission, advanced standing, curricula, and evaluation of achievement. The criteria for eligibility for admission are stringent in order to limit matriculation to (1) adults well qualified to undertake college work but lacking certain academic requirements for admission to other degree-granting schools and colleges of the University and (2) adults who, through work experience, have gained broad knowledge and high competency in some area of learning. This knowledge may be validated by special examination to entitle them to advanced standing toward a degree.

REQUIREMENTS FOR ADMISSION

The applicant must meet the following requirements:

1. He must be an adult who has already achieved outstanding success in his vocation.
2. He must have completed 12 semester hours of work at The George Washington University while enrolled in courses in the Off-Campus Division, the Division of University Students, or the Division of Special Students, with a grade of at least *C+* (quality-point index of 2.50). The student who has completed a substantial amount of college work elsewhere with excellent grades may apply for admission to degree candidacy after 6 semester hours at The George Washington University.
3. He must present valid reasons for selecting degree candidacy in the Campus Division of the College of General Studies rather than in another school or college of the University.
4. He must enroll for at least two courses a semester on Campus. Full-time study is encouraged.

The Campus Division offers programs leading to the degrees of Associate in Arts and Bachelor of Arts, as described under the Off-Campus Division, pages 34-37 and 38-42.

In cooperation with Columbian College, the School of Education, and the School of Government, the Campus Division makes available programs leading to the degree of Bachelor of Arts with majors in the

liberal arts and sciences, education, and government. Requirements for these programs are stated in the general University catalogue under the department of instruction concerned. Students selecting these majors must satisfy the prerequisite course requirements prior to admission to candidacy or as additional work after being admitted.

The program of each student admitted to this Division is carefully planned in consultation with a faculty adviser, who takes into account the student's maturity, background, work experience, and needs.

ARMED FORCES SECTION

The Armed Forces Section of the Campus Division was established for those service personnel who wish to study full-time at the University and who have only a limited time under military orders in which to complete their programs of study. Such students register for campus courses through the College of General Studies and remain under its administrative and academic control. By permission of the Dean they may enroll in appropriate courses in the Off-Campus Division.

Military and Naval personnel are eligible for admission to this section of the Campus Division if they meet the following requirements:

1. The applicant must be in attendance under official orders which give him a specified time in which to finish his degree requirements.
2. He must prove that the degree requirements can be completed in the time specified in his orders only by taking advantage of the advanced standing provisions of this College.
3. He must be in a position to enroll for full-time study.

By special arrangements with the Department of the Navy, a special naval section of the Armed Forces Section has been established. All naval personnel attend the University as full-time students, ordinarily for five semesters. Campus coordinator and academic adviser: Dr. John Francis Latimer, Building E, Room 300; FEderal 8-0250, Extension 494.

The Air Force Advanced Management Program, sponsored by the United States Air Force Institute of Technology, provides 50 semester hours of work in advanced management and supporting fields through the educational facilities of the School of Government for a selected group of Air Force officers. Those officers who qualify, by a combination of academic background and the satisfactory completion of this program can be awarded a Bachelor's degree by the College of General Studies. Officers who already hold a Bachelor's degree may take these courses for graduate credit toward a Master of Arts degree. Campus coordinator and academic adviser: Dr. David Springer Brown, Hall of Government, Room 205; FEderal 8-0250, Extension 404 or 540.

For administrative counseling, consult Robert Whittington Eller, Director, Campus Division, College of General Studies, 706 Twentieth Street NW.; Telephone: FEderal 8-0250, Extension 441 or 487.

REGULATIONS

Students in the Campus Division of the College of General Studies are subject to and are expected to familiarize themselves with the regulations of the University stated in the general catalogue, as modified in this Bulletin. Copies of the general catalogue are available at the Office of the Director of Admissions.

PROFESSIONAL IN-SERVICE TRAINING

Special programs are offered to meet the in-service needs of special groups, and others will be developed as the need arises.

DIVISION OF COMMUNITY SERVICES

This Division consists of The George Washington University Reading Clinic and a program of popular credit and noncredit courses, institutes, and lectures offered both on campus and off campus.

The Division was organized to provide needed auxiliary educational services and to promote programs designed to supplement the formal educational offerings of the University.

Noncredit courses in a wide variety of subject fields may be set up at the request of any interested group. There are no entrance requirements. The length of each course is determined by the wishes of the sponsoring group and the nature of the subject to be studied.

Civic clubs, church groups, trade associations, parent-teacher associations, and other organizations which are interested in promoting and organizing informal programs of study, setting up conferences, securing assistance in organizing and in developing their own leadership training courses or institutes, or receiving specialized advice or assistance are invited to consult Mrs. Lillian Fox Quigley, Assistant Director of the Division of Community Services of the College of General Studies. Call FEderal 8-0250, Extension 441.

Among the courses offered by the Division of Community Services, are the following:

ADMINISTRATIVE DEVELOPMENT

A noncredit course in techniques of management and instruction is offered as part of the Administrative Development Program of the Office of the Adjutant General, Department of the Army.

AMERICAN SPEECH AND DICTION

This noncredit course available to employees of foreign embassies, includes articulation drills, stress and intonation patterns in "standard" American English, discussion of dialect differences, and vocabulary-building exercises. Individually designed exercises and daily recordings on tape are used.

CHARTERED LIFE UNDERWRITERS PROGRAM

In cooperation with the Chartered Life Underwriters Institute, the College of General Studies has initiated a program of credit courses designed to assist insurance men in preparing for Chartered Life Underwriters' examinations.

EFFECTIVE SPEECH COMMUNICATION

Principles of effective speech communication, including practice in the organization, delivery, and evaluation of presentations commonly encountered in management situations.

ELEMENTARY ALGEBRA

This noncredit course in elementary algebra through quadratic equations is designed to prepare students for college algebra.

GROWTH OF POLITICAL PARTIES IN THE UNITED STATES

This noncredit course treats chronologically the growth of American political parties. It underlines those factors in our political history which are relevant to the current party struggle and the future course of politics: the role of party conventions; the importance of party platforms; the influence of particular personalities; the continuance of certain issues; the impact of wars and other disasters; the mechanisms for achieving party victory; and, with special attention, the relationship between minor parties and splinter groups and the fundamental two-party nature of our political system. Parties are considered socially and ethically as well as politically.

HOSPITAL ADMINISTRATION

A credit course of lectures and discussions broadly covering the field of hospital administration is designed especially for those working in hospitals at the executive and department-head level and for those employed in federal hospital programs who deal with various phases of hospital programming and operations.

Topics include the history of hospitals, the scope and organization of voluntary and federal hospital programs, the functional elements of hospitals, with emphasis on the application of modern management tools in Hospital Administration.

INSTITUTE FOR PARENTS

This noncredit "Institute for Parents" emphasizes four areas of study: understanding the gifted child, understanding reading problems, understanding modern school methods, and understanding the early adolescent. The primary objective of the class is to help parents understand their

children in relation to themselves as parents, to the school, and to the community. It is planned by the Fairfax County community to make this an annual Institute.

INTERNATIONAL COOKERY

This noncredit lecture and demonstration course on the basic dishes of various countries illustrates different methods of cooking and characteristic seasonings. Tastiness, low cost, high nutritional value, and availability of ingredients are considered in the choice of recipes.

INTERNATIONAL COOPERATION ADMINISTRATION PROGRAM

In cooperation with the International Cooperation Administration a fall and spring semester program is offered to the foreign students who are participants. Courses are offered on campus and include the following: Public Administration, Administrative Management, Governmental Budgeting, Governmental Accounting, Auditing, Tax Administration, Local Government Administration, Seminar on Public Finance and Economic Development, and English.

INVESTMENTS

A noncredit course in "How to Invest from \$50 to \$50,000" is frequently offered in answer to popular demand. Topics include insurance, wills, bank deposits, government bonds, real estate, various types of securities, the New York Stock Exchange, mutual funds, investment advisory services, and the importance of fitting the financial plan to the individual.

INVESTMENT MANAGEMENT

A noncredit course in management is available to those with a basic knowledge of the stock market and investment principles. Topics covered include the selection of stocks most suitable for specific objectives.

MANAGEMENT COMMUNICATION

Elements of the communication process; problems in communication; basic principles of effective communication, psychological and sociological aspects of communication; and problems of specific communication efforts.

NURSING EDUCATION

A credit course in the management of the hospital nursing unit is offered for nurses in the metropolitan Washington area. Emphasis is placed on the relation of the hospital nursing unit to the hospital and community, current concepts and standards in nursing service and their application to unit management, and the development of techniques for the implementation.

tion of concepts and policies. Other credit courses in this field are being developed.

PLANNING FOR RETIREMENT

This noncredit course is designed to help men and women plan efficiently for retirement. In ten sessions it covers a constructive program of thought and action for retirement planning, a program which has been used by many of the large business and industrial firms.

PREPARATION OF SUMMARIES

This noncredit course gives training in accurately summarizing classified documents and information in readable form.

PROFESSIONAL WRITING (Introductory)

A noncredit course is offered in the essentials of writing techniques. Manuscripts are submitted for the consideration and criticism of the teacher and class. Analysis is made of magazine writing opportunities for free-lance writers.

PROFESSIONAL WRITING (Advanced)

Emphasis is placed on improving quality and techniques to a professional, salable level. An interval of two weeks between classes gives the student a greater opportunity for manuscript preparation. Major emphasis is upon article writing.

PROGRAM PLANNING FOR ORGANIZATIONS

This noncredit course is designed especially for civic and club workers. Among the topics covered are the following: planning individual programs, public relations, the responsibility of leadership, and exploring projects and activities for a particular group.

MANAGEMENT FOR RESEARCH, DEVELOPMENT, AND TESTING LABORATORIES

This noncredit course is designed to train executives in the development of overall managerial skills. Specific objectives of the course are to give the executives a general familiarity with the tasks, problems, techniques, and methods of management; to relate these general principles to the functioning of their specialized business activities; and to provide them with a forum for discussing common problems and interchanging views, knowledge, and experience.

MANUSCRIPT CLINIC: BOOKS FOR CHILDREN

A practical service for writers who are in need of professional literary counsel and detailed constructive criticism by an experienced author,

editor, or critic. Completed work or work in progress will be accepted in any one of the following categories: (1) a work of fiction, not to exceed 30,000 words; (2) two or three short stories; (3) a biography; (4) a work of nonfiction, not to exceed 20,000 words, or several articles; (5) a translation, not to exceed 10,000 words; (6) a picture-story book, including illustrations; (7) an outline for a longer work, together with several sample chapters.

Writers will be instructed in the preparation of manuscripts for submission to a publisher, and advice on marketing will be available. After consulting with the coordinator, the consultee will meet with an appropriate consultant. Arrangements will be made for three subsequent private meetings at a time and place convenient to the persons concerned.

STUDIES IN MANAGEMENT

Studies of modern concepts of the management function. The background of modern management theory, the tools of management, human factors in management, direction of programs and formulation of policies.

WRITING FOR CHILDREN

A noncredit elementary workshop course is offered for beginning writers during the fall semester. An advanced workshop is offered in the spring semester.

ADMISSION AND REGISTRATION

A simplified system of admission and registration is used in noncredit courses.

Such courses are open to any individual interested in enrolling. When a noncredit course is organized at the request of some particular agency or group, admission may be restricted to the students recommended by the sponsoring organization. Classes may be limited in size in order to maintain the standards desired.

FEES

The tuition fees for noncredit courses are determined by the length and nature of the course.

READING CLINIC

The Reading Clinic, Binney Hall, 2018 I Street NW., offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition, special reading improvement classes are conducted on the high school and adult levels.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests; and the various reading and spelling tests. Results are

interpreted, and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students and adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachistoscope, rate accelerator, and controlled reader are used for increasing speed of comprehension.

FEES

Individual Diagnosis	\$35.00
Individual Reading Instruction	4.50 a lesson
Semi-individual Instruction	3.50 a lesson
Small Groups with common reading difficulties	2.75 a lesson
Materials fee	4.00

All fees for diagnostic and corrective work are payable in advance at the Office of the Cashier. Reading Improvement Course fees are payable in full at the time of registration. For further information, consult Miss Mary E. Coleman, Director, or Mrs. Zella M. Huse, Assistant Director, Binney Hall, 2018 I Street NW.; FEderal 8-0250, Extension 491 or 598.

COURSES OF INSTRUCTION

On the following pages of this CATALOGUE, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered by the Off-Campus Division of the College of General Studies. The courses as here listed are subject to some slight change. The University reserves the right to withdraw any course announced.

Courses of instruction are scheduled by Training Directors of the various groups, organizations, agencies, and installations interested in conducting an Off-Campus program of college courses. These classes are generally offered in the late afternoon or evening, are identical with the daytime and evening sections of corresponding courses on campus, are taught by many of the same instructors, and carry the same amount of credit. By taking the evening and summer classes and extending the time of study beyond the customary four years, a student who is able to give only part of his time to college work may complete a regular curriculum and obtain a degree.

EXPLANATION OF COURSE NUMBERS

Courses are assigned dual numbers. The first is a serial number assigned by the College of General Studies at the time of registration. The serial number does not appear in this catalogue. The second number is a departmental course number assigned by the department concerned. The serial numbers are used to distinguish one class from another when the same course is offered simultaneously at different places. The departmental numbers indicate the academic level of each course.

The following system of numbering is used:

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the officer of instruction, and when the completion of additional work has been certified by the officer of instruction.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of

the officer of instruction, to qualified seniors; they are not open to Junior College students or other undergraduates.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3-3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ACCOUNTING

Executive Officer: Ralph Dale Kennedy, Ph.D., Professor of Accounting, Building N, Room 11 (718 Twenty-first Street NW.), FEderal 8-0250, Extension 243

1-2 *Introductory Accounting* (3-3)

First half: basic principles underlying accounting records used by single proprietorships and partnerships, preparation of the work sheet and financial statements. *Second half:* basic principles underlying accounting records used by corporations; introduction to cost accounting, analysis of financial statements, and valuation and amortization problems. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor.

3 *General Accounting* (3)

Study of accounting systems used by single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

101 *Cost Accounting* (3)

Theory and purposes of industrial cost accounting; treatment of systems of cost control and determination; analysis and interpretation of cost data. Prerequisite: Accounting 1-2.

121-22 *Intermediate Accounting* (3-3)

First half: valuation and amortization problems of current assets, long-term investments, tangible fixed assets, intangible assets, and deferred charges; accounting for current, noncurrent, contingent, and estimated liabilities. Prerequisite to 121: Accounting 2 or permission of the instructor. *Second half:* accounting for the organization, financing, operation, and dissolution of corporations and partnerships; basic principles of consignment and installment sales. Prerequisite to 122: Accounting 121 or permission of the instructor.

181 *Accounting Systems* (3)

Theory and procedure of designing and installing accounting systems, for collecting, recording, analyzing, and presenting accounting data. Prerequisite: Accounting 101, 121-22, and 171, or permission of the instructor.

193 *Business Budgeting* (3)

Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1-2.

211-12 Managerial Accounting (3-3)

First half: analysis of the accounting system with special reference to the use of financial and operating records and accounting reports as tools of management; a study of valuation and amortization problems including the influence of price level changes on accounting data. Prerequisite: Accounting 1-2 or 3. *Second half:* a survey of internal accounting controls, commercial budgets, and cost accounting systems used by management in directing and controlling a business. Prerequisite to Accounting 212: Accounting 211 or permission of the instructor.

293 Budget Preparation and Control (3)

Principles of and research on the formulation, adoption, and execution of a system of budgetary control to aid in the management of commercial or industrial businesses.

BIOLOGY

Executive Officer: Paul William Bowman, Ph.D., Professor of Biology, Building C, Room 410 (2029 G Street NW.), FEderal 8-0250, Extension 219

1 Survey in Biology (3)

Systematic study of the plant and animal kingdoms, with emphasis upon the interdependence of living things and their relations with their environments. Introduction to evolution, heredity, public health, and conservation.

BUSINESS AND PUBLIC ADMINISTRATION

Executive Officer: James Carlton Dockeray, Ph.D., Professor of Finance, Building Y, Room 13 (802 Twenty-first Street NW.), FEderal 8-0250, Extension 512 and 539

BUSINESS ADMINISTRATION**101 Business Organization and Combination (3)**

Simple and interrelated forms of business enterprise and their control by government.

102 Fundamentals of Management (3)

Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking.

105 Personnel Management (3)

Industrial personnel and manpower programs, organizations and policy in personnel activities.

106 Problems in Personnel Management (3)

Principles of manpower management illustrated by cases drawn from business, industry, and government. Prerequisite: Business Administration 105.

107 Labor-Management Contracts (3)

Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations.

109 Office Management (3)

Organization and layout of an office, use of office machines and appliances, planning and execution of work, supervision problems.

- 113 *Real Estate* (3)
Fundamentals of real estate practice; leasing and property management; valuation, financing, and taxation.
- 117 *The Fundamentals of Life Insurance and Annuities** (3)
(Part I)
The fundamental principles of life insurance with emphasis on the economic and social functions.
- 118 *Business Life Insurance** (3) (Part II)
Business life insurance, accident and sickness insurance, group insurance, and pensions.
- 119 *Law, Trusts, and Taxation** (3) (Part III)
The fundamentals of general commercial law, including law of life insurance, wills, trusts, estates, taxation, and business insurance.
- 120 *Economics and Finance** (3) (Part IV)
A survey of finance (banking, credit, corporation finance, and investments) and a survey of economic principles.
- 131 *Business Finance* (3)
Basic principles involved in the financing of business enterprises. Prerequisite: Accounting 1-2.
- 141 *Principles of Marketing* (3)
An introduction to marketing structure and its relation to the total economy, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies. Prerequisite: Economics 1-2.
- 161 *Commercial Law: Contracts, Sales, Agency, and Bailments* (3)
- 162 *Commercial Law: Negotiable Instruments, Property, Mortgages* (3)
- 163 *Law in Relation to the Form of Business Units: Corporations, Partnerships, and Trusts* (3)
- 193 *Management Communication* (3)
A survey course in the problems of communication; written communication: style and format; oral communication: oral briefing and presentation; group leadership; rapid reading; completed staff work; and related subjects.
- 198 *Case Problems in Management* (3)
Principles and techniques of management illustrated by cases drawn from business and industry. Prerequisite: Business Administration 102, 105, 131, 141.
- 218 *Data Processing* (3)
Selecting and adapting data processing equipment, characteristics of leading systems, elements of programming.

* These courses are a part of a program to prepare individuals for the Chartered Life Underwriters Examinations. Classes meet once a week for thirty weeks.

251 *Seminar in Retail Management* (3)

Research in retailing practices, with emphasis on trends, new developments, and current problems.

261 *Seminar in Advanced Management* (3)

Principles of organization. Analysis of organization problems involving the relation of government bureaus and offices with military services, the Congress, the public, other government departments, and with industrial concerns. Review and analysis of business administration and management. Intensive training in conference techniques and the oral presentation of points of view.

268 *Management Engineering* (3)

Analysis of the techniques for initiation and implementation of management engineering programs, with emphasis on organization and methods surveys, including the study of work measurements, work simplification, management audits, and other management improvement programs.

281-82 *Hospital Administration* (3-3)

A course of lectures and discussions broadly covering the field of hospital administration is designed especially for those working in hospitals at the executive and department-head level and for those employed in federal hospital programs who deal with various phases of hospital programming and operations. Topics include the history of hospitals, the scope and organization of voluntary and federal hospital programs, the functional elements of hospitals, with emphasis on the application of modern management tools in hospital administration.

286 *Management in the Armed Forces* (3)

Special problems of military organization and management; applicability of business management techniques to the armed forces.

288 *Executive Leadership* (3)

Examination of principles and problems of executive leadership and development; intensive consideration of basic issues and guides to executive action in business and public administration; review of the literature, significant research findings, and practical illustrations.

293-94 *Business Research* (3-3)296 *Seminar in Controllershship* (3)

Research on advanced problems of the controller in all types of business organization and the Federal Government.

299-300 *Thesis* (3-3)

PUBLIC ADMINISTRATION

210 *The Management Function* (3)

Principles and processes of management with particular attention to planning of organization, direction and coordination of work, internal communication, and measurement of achievement in government.

213 *Administration in Government* (3)

Selected topics in problems of federal administration, with particular attention to the role of Congress and the public in the administrative processes.

- 231 *Public Personnel Management* (3)
Basic principles; structure and organization of personnel offices; responsibilities; inter-agency relationships; personnel staffing, training, and work measurement.
- 232 *Personnel Procedures and Problems* (3)
Study of such personnel functions as recruitment, selection, placement, promotion, supervision, evaluation, classification, and training. Practical problems of personnel administration.
- 233 *Seminar in Manpower Development and Utilization* (3)
Research projects and case studies in ways and means of increasing employee potential, use of training programs, executive development, incentive systems.
- 237 *Intermediate Management and Supervision* (3)
The role of the supervisor and intermediate manager, methods for improving group performance, work measurement, pertinent regulations governing federal personnel.
- 251 *Governmental Budgeting* (3)
The role of budgeting in management; the principles and practices of budgetary formulation and administration.
- 252 *Seminar in Planning and Programming* (3)
Performance budgeting; relating the work program to the fiscal program; budgetary evaluation. This course is primarily for students who have completed Public Administration 251.
- 260 *Seminar in Policy Formulation and Administration* (3)
Development and administration of agency goals and objectives, influence of individuals upon them; factors involving informal organization such as internal pressure groups, use of sanctions, and role of executive in furthering administrative policy.
- 299-300 *Thesis* (3-3)

CHEMISTRY

Executive Officer: Charles Rudolph Naeser, Ph.D., Professor of Chemistry, Samson Hall, Room 211 (2036 H Street NW.), FEderal 8-0250, Extension 261.

- 3-4 *Fundamentals of Physical Science* (4-4)
A year course: credit is not given for the first half until the second half is completed. Introduction to methods and achievements of physical science; covering selected topics in chemistry, physics, astronomy, and geology.
- 11-12 *General Chemistry* (4-4)
A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). An elementary course in general chemistry. Prerequisite: one year of high school algebra.
- 21 *Qualitative Inorganic Analysis* (4)
Lecture (2 hours), laboratory (6 hours). Theoretical and practical study of methods of separating and identifying the more common cations and anions using semi-micro techniques. Prerequisite: Chemistry 12.

131-32 *Inorganic Chemistry* (2-2)

A year course: credit is not given for the first half until the second half is completed. Application of modern chemical theories to inorganic substances and reactions; detailed study, developed from the periodic tables, of the descriptive chemistry of the more common elements. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111-12 and 113-14.

ECONOMICS

Executive Officer: Donald Stevenson Watson, Ph.D., Professor of Economics, Hall of Government, Room 312 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 234

1-2 *Principles of Economics* (3-3)

Lecture (2 hours), recitation (1 hour). Survey of the major economic principles, institutions, and problems in contemporary life. Economics 1 is prerequisite to Economics 2.

121 *Money and Banking* (3)

Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems.

126 *Foreign Exchange and International Finance* (3)

The theory and practice of the foreign exchanges; current methods of international transfer.

133 *The Economy of the Soviet Union* (3)

Development and main features of the economic life of the Soviet Union.

241 *Labor Economics* (3)

Implications of industrialism for labor, questions of social policy, contributions of economics to solutions of labor problems.

244 *Collective Bargaining* (3)

The collective bargaining contract and the elements comprising it, analysis of the policies of labor and of management.

267 *Economic Organization of the Communist Orbit* (3)

Development of the Soviet-type economy; organization under the Soviets; policies and problems: monetary, fiscal, production, allocative, foreign trade, economic growth.

EDUCATION

Executive Officer: Blake Smith Root, Ed.D., Professor of Education, Monroe Hall, Room 202 (2115 G Street NW.), FEderal 8-0250, Extension 424 and 508

109-10 *Human Development, Learning, and Teaching* (3-3)

Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. For the general student as well as the prospective teacher. *First half:* nature of human growth, development, and learning, illustrated by observation of children in learning situations. *Second half:* nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations.

- 112 *Guidance in Elementary Schools* (3)
Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Education 109-10, 121-22.
- 113 *Elementary School Art* (3)
Lecture and laboratory (3 hours), field work—as arranged. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Material fee, \$4.50.
- 114 *Elementary School Music* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22.
- 115 *Teaching of Reading in the Elementary School* (3)
Lecture (2 hours), field work (2 hours)—as arranged. A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 116 *Elementary School Social Studies* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 117 *Elementary School Science* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 118 *Teaching Science in the Elementary School* (3)
Designed to meet the needs of elementary teachers who wish to improve their science background and become more skillful in the method of teaching; content based on needs of group; nontechnical with respect to science content, practical in method aspect; simple experiments, observations, use of printed materials, field trips, observation of teaching; a how-to-do course for teachers who have little science knowledge and feel insecure in their science teaching. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 120 *Elementary School Arithmetic* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 121-22 *Society and the School* (3-3)
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. For the general student as well as the prospective teacher. *First half*: the historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. *Second half*: organization and operation of schools; principles and functions; role of the teacher.
- 128 *Children's Literature* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Exploring and evaluating the newer books for children and the children's classics,

understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology I and 22.

138 *Teaching Social Studies* (2 to 4)

Lecture (2 hours), field work (2 hours)—as arranged. Prerequisite: twenty-four semester hours of social studies.

146 *Teaching Foreign Languages* (2 to 4)

Prerequisite: eighteen semester hours of one foreign language.

161 *Management of the Hospital Nursing Unit* (3)

Analysis of nursing today, the hospital, structure and changing functions, basic concepts of management, personnel practices and activities, interpersonal relationships, legal aspects and safety factors, economics—inventories, and evaluation procedures of the hospital nursing unit.

205-6 *The Curriculum* (3-3)

For experienced teachers. *First half*: curriculum foundations and issues; comparison of curriculum patterns. *Second half*: principles and procedures in curriculum development; group consideration of student problems.

207 *Curriculum Materials* (3)

For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations.

208 *A Workshop in Human Development* (6)

A workshop for agricultural extension staff members designed to apply the principles of the behavioral sciences to their work.

209 *Child Growth and Development* (3)

An interdisciplinary approach to child development taking into account such factors as society and culture, socialization, and socializing agents with particular emphasis on the home and school.

210 *Adolescent Growth and Development* (3)

A consideration of physical, intellectual, and cultural backgrounds of adolescence with particular emphasis on social development, adjustment to organized society, educational development and adjustment to school, and home relationships.

211 *Evaluation in Education* (3)

Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation.

213-14 *History of Education* (3-3)

First half: the European backgrounds of American education. *Second half*: the evolution of the American school system.

215 *Education of Exceptional Children* (3)

For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance.

- 216 *Education of Slow-learning Children* (3)
Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.
- 217-18 *Philosophy of Education* (3-3)
First half: designed to help students formulate a personal philosophy of education. Second half: social foundations of education—a study of the forces that shape the policies and offerings of the school.
- 221 *Early Childhood Education* (3)
For experienced teachers. Emphasis on methods, materials, and learning experiences designed to meet the developmental needs of kindergarten and primary-grade children.
- 223-24 *Reading Problems* (3-3)
For experienced teachers. Study of reading difficulties on elementary and secondary school levels; classroom and clinical procedures in solving reading problems.
- 227 *Basic Issues in Elementary Education* (3)
A consideration of basic issues in the purposes, organization, and conduct of elementary education. Emphasis on the philosophical and psychological roots of fundamental assumptions as they relate to classroom practices.
- 228 *Instructional Areas in Elementary Education* (3)
Critical appraisal of the objectives, organization, content, and teaching methods in the language arts, arithmetic, social studies, science, arts and crafts, health and physical education.
- 229 *Administration of Elementary Education* (3)
For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action.
- 233 *Audio-visual Education* (3)
Lectures (2 hours), laboratory (1 hour). Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the care, operation, maintenance, and use of audio-visual materials and equipment. Material fee, \$7.
- 241 *Education of the Gifted* (3)
For classroom teachers. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects.
- 243 *Human Relations in the Classroom* (3)
Principles and practices involved in interpersonal relationships between learner and teacher and among learners.
- 245 *School and Community* (3)
The school as an important member of a team of social agencies that builds the community.
- 251 *Guidance in Secondary Schools* (3)
Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program.

261 *Improved Method of Instruction in Tailoring* (3)

Recent simplified construction techniques including the Bishop Method in relation to tailoring coats and suits. Evaluation of the techniques and their application to various levels of teaching in the Metropolitan area. Illustrative material developed from the techniques. Each student will construct a garment outside of class using the simplified techniques for constructive criticism by class members.

263-64 *Employee Training* (3-3)

First half: nature and purpose, review of major programs—orientation, supervisory, apprentice, clerical skills, communication. *Second half:* administrative problems and practices, training media, coordination with other management functions. Prerequisite: adequate professional preparation or two years of experience in employee training.

265-66 *Teaching Secondary School English* (3-3)

A refresher course for teachers of English. Discussion of new approaches to high school content. Offered in cooperation with the departments of English and Speech. *First half:* communication skills—structural linguistics, composition, and speech. *Second half:* American and English literature.

271 *The Teacher and School Administration* (3)

A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions.

276 *Seminar: Public Relations in School Administration* (3)

Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.

281 *Group Procedures in Education* (3)

Theory, practice, evaluation, and application to all educational levels.

282 *Use of Community Resources* (3)

A course for teachers on all levels, with emphasis on learning to use community resources to strengthen their programs of learning and teaching. The Smithsonian Institution will receive special attention as one of the examples of a valuable community resource.

285 *Extra-classroom Activities* (3)

Nature and purposes of selected activities—homeroom, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation.

ELECTRICAL ENGINEERING

Executive Officer: Nelson Thomas Grisamore, Ph.D., Professor of Electrical Engineering, Tompkins Hall, Room 313 (725 Twenty-third Street NW.), FEderal 8-0250, Extension 257

11 *Electric Circuits* (3)

Current, voltage, power, circuit parameters, Kirchhoff's laws and circuit differential equations; simple transients; RMS and average values; steady-state mesh and node analysis; determinants; theorems; resonance; polyphase circuits.

Prerequisite: Physics 15. Prerequisite or concurrent registration: Mathematics 30.

102 *Engineering Electronics* (3)

Introductory treatment of thermionic emission, vacuum-tube characteristics, graphical analysis, rectifiers and power supplies, amplifiers, oscillators, and other electronic circuit devices. Prerequisites: Electrical Engineering 11 and Mathematics 112.

171 *Digital Circuitry and Systems* (3)

Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits. Prerequisite: Mathematics 111, Electrical Engineering 102 or Physics 132.

203 *Operational Analysis of Linear Systems* (3)

Transient analysis of linear, lumped-parameter electrical and mechanical systems by operational methods with emphasis on Laplace transforms.

ENGINEERING ADMINISTRATION

Director: Jack Edward Walters, M.S. in M.E., Ph.D., Professor of Engineering Administration, Tompkins Hall, Room 307 (725 Twenty-third Street NW.), FEderal 8-0250, Extension 250

201 *Engineering Administration I* (3)

Application of scientific method to the administrative processes of (1) planning and (2) organizing; including development of objectives, key factors in planning, basics of organization, stages of organizational growth, special problems of organization in an engineering or scientific enterprise.

202 *Engineering Administration II* (3)

Continuation of Engineering Administration 201. Application of scientific method to the administrative processes of (3) managing or directing and (4) evaluation and control. Study of delegation; decentralization; personnel relations; management development; systems engineering; automation; financial analysis, budgeting, and administrative audits.

ENGLISH*

Executive Officer: Charles William Cole, Ph.D., Professor of American Literature, Monroe Hall, Room 404 (2115 G Street NW.), FEderal 8-0250, Extension 422

ENGLISH COMPOSITION

C *English Practice* (0)

Instruction, drill, and exercises in grammar, vocabulary, spelling, and mechanics in general; instruction and exercises in composition and reading. This

* Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared for English 1 will be assigned to English C. In lieu of English A, Off-Campus students may, if they desire, be given permission to register for English 1X on campus. English 1 is prerequisite to all other courses in English.

course is designed to prepare students for English 1. It is offered in the College of General Studies only.

1 *English Composition* (3)

Review of grammar, exercises in composition, readings.

1X *English Composition* (3)

An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets five hours a week and carries 3 semester hours of credit. The tuition fee for Off-Campus students is \$76 (the regular fee of \$17 a semester hour, plus an additional fee of \$25).

2 *English Composition* (3)

Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1.

11 *The Writing of Reports* (3)

Theory and practice in the writing of technical reports. Prerequisite: English 1 and 2.

WORLD LITERATURE

41-42 *Introduction to World Literature* (3-3)

First half: a survey of Western literary heritage from Homer to Milton. Second half: a review of Western literature from the English metaphysical poets to Franklin Delano Roosevelt.

ENGLISH LITERATURE

51-52 *Introduction to English Literature* (3-3)

A historical survey. Prerequisite: English 1.

135-36 *Shakespeare* (3-3)

AMERICAN LITERATURE

71-72 *Introduction to American Literature* (3-3)

144 *American Literature Since 1920* (3)

Poetry, drama, and the novel. Readings and discussion.

GEOGRAPHY

Executive Officer: Robert Dale Campbell, Ph.D., Professor of Geography, Building I, Room 202 (2135 G Street NW.), Federal 8-0250, Extension 287 and 298

51 *Introduction to Geography* (3)

A study of place attributes and characteristics, patterns and associations of physical and cultural earth features.

- 52 *World Regions* (3)
The analysis of world regional divisions, description and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man.
- 113 *Geomorphology** (3)
Nature and evolution of earth forms, with special emphasis upon relief features of North America. Prerequisite: Geography 51.
- 114 *Weather and Climate** (3)
Rudimentary atmospheric physics, air mass and frontal weather analysis, regional climatology. Prerequisite: Geography 51.
- 126 *World Food Supply* (3)
World patterns of production and consumption of food stuffs, commercial and subsistence agriculture. World capabilities for feeding the world's population.
- 132 *Land Use* (3)
Principles of geographic area analysis and land planning. Prerequisite: Geography 51, 113.
- 176 *Photo Geography* (3)
Use of air photographs in identifying topographic features; agricultural, residential, and industrial landscapes. Prerequisite: Cartography 2; Geography 132.
- 195 *Eastern and Southeastern Asia†* (3)
- 196 *The Soviet Union†* (3)
- 261 *Physical Weather Prediction* (3)
Review of the basic equations and principles, filter approximations, scale considerations; the importance of modeling approximations; prediction of zonal momentum; a comparison between models using balanced equations and primitive equations. Discussion of the energetics of the atmosphere and its importance for short range prediction; moistadiabatic processes; consideration of truncation errors and numerical stability to finite difference schemes.

CARTOGRAPHY

- 1 *Map Interpretation* (3)
Characteristics and uses of different kinds of maps and charts: geographic and grid coordinates, attributes of projections, symbolization.
- 2 *Photo Interpretation* (3)
An introduction to the techniques of interpretation of air photographs for the purpose of deriving information in the fields of geography, topography, resource conservation, and mineral exploration. Prerequisite: Geography 51.
- 11 *Cartographic Drafting and Descriptive Geometry* (3)
Special visualization, engineering drawing, schematic diagrams, and descriptive geometry; use of drafting and scribing instruments and materials; exercises in cartographic design and symbolization in the drafting of topographic and special-purpose maps.

* This course is offered off campus only.
† Regional survey.

12 *Topographic Surveying* (3)

Principles, methods, and instruments used in making space measurements, including layout, elements of simple curves, coordinate system, and treatment of observational errors. Prerequisite: Mathematics 12; Cartography 11. Surveying fee, \$13.

13 *Higher Surveying* (3)

Elements of geodesy, triangulation, topography, hydrography, and precise trigonometric leveling. Prerequisite: Cartography 12. Surveying fee, \$13.

17-18 *Elementary Photogrammetry* (3-3)

Principles, methods, and instruments used in photographic surveying and production of maps, photographic interpretation, principles of stereoscopy. Prerequisite: Cartography 13.

110 *Map Projections* (2)

Characteristics, mathematical development, and practical construction of major map projections and grid systems. Prerequisite: Mathematics 29; Cartography 13.

111 *Map Reproduction* (1)

Graphic arts reproduction methods, with special emphasis on procedures and problems of preparing and processing line and half-tone reproduction copy for single or multi-color photolithographic reproduction.

155 *Elements of Geodesy* (3)

Development of principles and formulas basic to theoretical and applied geodesy, with application to representative problems. Prerequisite: Mathematics 51.

156 *Geodetic Astronomy* (3)

Development and application of principles and formulas for the astronomic determination of latitude, longitude, and azimuth. Prerequisite: Cartography 155.

191-92 *Map and Chart Construction* (3-3)

Theory and practice in the various phases of map and chart construction; practice in the preparation of original maps and charts for reproduction. Prerequisite: Cartography 156.

GEOLOGY

Executive Officer: Geza Teleki, Ph.D., Professor of Geology, Building C, Room 5 (2029 G Street NW.), Federal 8-0250, Extension 517

3 *Introductory Geology* (3)

A survey course covering the principles of geology. (A nonlaboratory course for Off-Campus students only.)

4 *Introductory Geology* (3)

Geological periods, evolution of life on earth. (A nonlaboratory course for Off-Campus students only.)

105-6 *Fundamentals of Geophysics* (3-3)

Survey of the theories and methods of investigation used in determining the constitution and dynamics of the earth, its oceans, and atmosphere. (It is

recommended that students take Geology 3, 4: *Introductory Geology*, or the equivalent.) Prerequisite: Geography 113.

GERMANIC LANGUAGES AND LITERATURES

Executive Officer: Wolfram Karl Legner, Ph.D., Professor of German, Monroe Hall, Room 405 (2115 G Street NW.), FEderal 8-0250, Extension 282

1-2 *First-year German* (3-3)

A year course: credit is not given for the first half until the second half is completed. The essentials of German grammar; translation of easy prose.

3-4 *Second-year German* (3-3)

A year course: credit is not given for the first half until the second half is completed. Selections from modern German prose; review of grammar. Prerequisite: German 1-2 or two years of high school German.

9-10 *German Conversation and Composition* (3-3)

Aural training and oral practice.

HISTORY

Executive Officer: Roderic Hollett Davison, Ph.D., Professor of European History, Hall of Government, Room 404 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 232

39-40 *The Development of European Civilization* (3-3)

Primarily for freshmen. *First half*: the political, social, economic, and cultural history of the Old World from ancient times to 1715. *Second half*: from 1715 to the present.

71-72 *The Development of the Civilization of the United States* (3-3)

Primarily for sophomores. *First half*: the political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. *Second half*: from 1865 to the present.

145-46 *History of New Russia* (3-3)

Twentieth century Russia in its liberal, revolutionary, and totalitarian phases. *First half*: Bolshevism's road to power in the Lenin Era, 1881-1921. *Second half*: the politics of empire in the Stalin Era, 1921-1953.

169 *Latin American History: Institutions and Problems* (3)

Conquest and settlement; colonial institutions; achievement of independence; and the national period, and major problems.

181-82 *Diplomatic History of the United States* (3-3)

Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; and the activities of the American secretaries of state and diplomatic agents. *First half*: to 1898. *Second half*: since 1898.

183 *Oversea Expansion of the United States* (3)

The political, economic, social, and cultural life of our outlying possessions.

HOME ECONOMICS

Executive Officer: Frances Kirkpatrick, A.M., Professor of Home Economics,
Building B, Room 23 (2024 G Street NW.), FEderal 8-0250, Extension 365

173 *Home Furnishings for Teachers* (3)

House furnishings as part of the environment of modern home life; the role of beautiful homes in the development of ideals and value scales; the choice of materials in the light of family means.

JOURNALISM

Executive Officer: Ross Pelton Schlabach, Jr., M.S., Professor of Journalism,
Monroe Hall, Room 426 (2115 G Street NW.), FEderal 8-0250, Extension 379

116 *Principles of Public Relations* (3)

The press and information office, technique of news releases, public addresses as news, promotion of feature material, the problem of public relations in government agencies and commercial establishments.

117 *Problems in Public Relations* (3)

Case histories of successful public relations problems, discussion of public relations procedures and ethics, preparation of specific public relations projects.

141 *General Editing for Publication* (3)

Editing procedures and techniques, proof reading, titles, arrangement, layout, type uses. Intended for students preparing for trade publications and public relations work rather than newspaper work.

MATHEMATICS

Executive Officer: Nels David Nelson, Ph.D., Professor of Mathematics, Monroe Hall, Room 422 (2115 G Street NW.), FEderal 8-0250, Extension 388

3 *College Algebra* (3)

Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

6 *Plane Trigonometry* (3)

Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor).

12 *Analytic Geometry* (3)

Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry.

29 *Calculus I* (3)

Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12.

- 30 *Calculus II* (3)
Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29.
- 31 *Calculus III* (3)
Infinite series, partial differentiation, multiple integrals, introduction to vector concepts, improper integrals. Prerequisite: Mathematics 30 (or concurrent registration therefor), or Mathematics 20.
- 110 *Mathematics for Meteorologists* (3)
- 111 *Mathematics for Engineers and Physicists I* (3)
Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 30 and 31.
- 112 *Mathematics for Engineers and Physicists II* (3)
Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132.
- 123 *Theory of Equations* (3)
- 132 *Differential Equations* (3)
- 139 *Advanced Calculus I* (3)
Limits, continuity, real number system, mean value theorems, partial differentiation, implicit function theorems, transformations, and mappings.
- 171 *Vector Analysis* (3)

MECHANICAL ENGINEERING

For information consult Martin Alexander Mason, B.S. in Eng., Ing.-Dr., Professor of Civil Engineering, Tompkins Hall, Room 103 (725 Twenty-third Street NW.), FEderal 8-0250, Extension 246

- 10 *Graphical Communication* (2)
Spatial visualization, engineering drawing, schematic diagrams, descriptive geometry. A laboratory course.

PHILOSOPHY

Executive Officer: Charles Edward Gauss, Ph.D., Elton Professor of Philosophy, Building N, Room 30 (718 Twenty-first Street NW.), FEderal 8-0250, Extension 538

- 51-52 *Introduction to Philosophy* (3-3)
A critical introduction to the problems of modern philosophy in relation to scientific and social developments since the Renaissance. This course is not merely intended as an introduction to those courses in philosophy which follow but is a unit complete in itself for those students in other departments interested in the problems of philosophy relevant to modern thought.
- 121-22 *Logic and Scientific Method* (3-3)
First half: the elementary principles of valid reasoning with emphasis on developing skill in using these principles, introductory consideration of symbolic

logic, the nature of a formal system. *Second half:* general analysis of the methods of investigation and reasoning used in the natural and social sciences, theory of scientific inference, theories of probability.

PHYSICAL EDUCATION

Executive Officer: Loretta May Stallings, A.M., Associate Professor of Physical Education for Women, Building H, Room 30 (714-16 Twentieth Street NW.), FEderal 8-0250, Extension 343 and 341.

- 101 *Physical Education in the Elementary School* (3)
Physical growth and development of the child and adolescent. Survey of age characteristics and organizations of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, and self-testing activities.

PHYSICS

Acting Executive Officer: Lewis Slack, Ph.D., Professor of Physics, Corcoran Hall, Room 209 (725 Twenty-first Street NW.), FEderal 8-0250, Extension 501

- 11 *Introductory Physics* (3)
An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. Prerequisite: high school algebra and plane geometry. Material fee, \$11.
- 14 *General Physics* (3)
Mechanics, wave motion, and sound. Prerequisite: Physics 11 and Mathematics 29. Material fee, \$11.
- 15 *General Physics* (3)
Electricity and magnetism. Prerequisite: Physics 14. Prerequisite or concurrent registration: Mathematics 30. Material fee, \$11.
- 16 *General Physics* (3)
Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30, and consent of the instructor.
- 55 *Physical Measurements* (3)
Lecture (2 hours), laboratory (3 hours). Theory and methods of precise measurements in the several fields of physics. Prerequisite: Physics 11 and 12. Mathematics 29. Material fee, \$11.
- 106 *Optics* (3)
Geometrical optics; elementary theory of wave motions; interference, diffraction, polarization, and dispersion of light; laws of black-body radiation. Prerequisite: Physics 16 or 8, Mathematics 31 or 20.
- 132 *Electronics* (3)
Lecture (2 hours), laboratory (3 hours). The phenomena of electron emission from solids, the physical properties of electron tubes, and the principles underlying their basic applications. Prerequisite: Physics 16 or 8 and 55, and a course in d-c and a-c circuits in Physics or Engineering. Material fee, \$11.

- 138 *Transistor Principles and Circuits* (3)
Qualitative description of transistor action, introduction to transistor circuit analysis, low frequency circuits, power amplifiers, high frequency equivalent circuits, video and intermediate frequency amplified design, linear and non-linear oscillators. Prerequisite: Physics 132 or the equivalent.
- 211 *Classical Physical Theory* (3)
Dynamics of systems of particles and of rigid bodies, generalized coordinates. Prerequisite: Physics 101; Mathematics 112 or 132, 171. (Mathematics 171 may be taken concurrently.)
- 212 *Classical Physical Theory* (3)
Classical nonrelativistic and relativistic field theories. Prerequisite: Physics 101 and 105; Mathematics 132, 171.

POLITICAL SCIENCE

Executive Officer: John Withrow Brewer, Ph.D., Professor of International Law, Hall of Government, Room 204 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 241

- 1 *Introduction to Government* (3)
Basic principles and problems of political life: theories, forms, and processes of government in the United States and foreign countries. Attention is also given to international relations.
- 9-10 *Government of the United States* (3-3)
First half: structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. Second half: state and local governments; civil rights; major functions of government at federal, state, and local levels.
- 107 *Problems in Modern Political Thought* (3)
Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries.
- 111 *Introduction to Comparative Government* (3)
Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France.
- 112 *Introduction to Comparative Government* (3)
Government and politics of the principal political systems of Central and Eastern Europe: Germany and the Soviet Union.
- 113 *Political Problems of the British Commonwealth of Nations* (3)
From Colonial Empire to modern Commonwealth: questions of equal partnership; governments and policies in the principal Commonwealth states; problems of new states.
- 114-15 *Central-Eastern Europe* (3-3)
A general survey dealing with the area of present-day Germany, the successor states of the Austro-Hungarian monarchy, Poland, and the Balkan States of Rumania, Bulgaria, and Yugoslavia (and the Soviet fringe of Latvia, Lithuania, Estonia, and Finland).

- 121-22 *The Constitution of the United States* (3-3)
Judicial power of federal courts in constitutional interpretation. *First half:* emphasis on separation of powers, federal-state relationships, and taxation. *Second half:* emphasis on constitutional protection of civil rights.
- 145 *Political Parties and Politics* (3)
Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence on President and Congress. (Not open to students who have credit for former Political Science 116.)
- 151-52 *Public Administration* (3-3)
Introductory survey of the theory and practice of governmental administration and its relation to politics, legislation, the courts, and nongovernmental organizations and interests.
- 171 *International Politics* (3)
Basic forces underlying the conduct of international relations and the formation of foreign policy; power politics, imperialism, collective security, and international cooperation.
- 191-92 *Government and Politics in the Middle East* (3-3)
First half: international relations and governmental problems of the Arab world and Israel. *Second half:* international relations and governmental problems of new nations of Central Africa and Southern Asia.
- 194 *Far Eastern Politics: Contemporary International Relations in the Pacific Area* (3)
Background and development of the major states of East Asia with attention to the constitutional systems and the foreign politics of the region.
- 195 *Southeast Asia Today* (3)
Current political problems in South and Southeast Asia with attention to the historical, geographical, and economic backgrounds of the countries concerned: India, Burma, Thailand, Cambodia, Laos, and Vietnam (north and south).

PSYCHOLOGY

Executive Officer: Thelma Hunt, Ph.D., M.D., Professor of Psychology, Monroe Hall, Room 427 (2115 G Street NW.), FEderal 8-0250, Extension 285

- 1 *General Psychology** (3)
The fundamental principles underlying human behavior.
- 4 *Psychology of Adjustment* (3)
Processes involved in the total adjustment of the individual with emphasis on social environment; development in the individual of adjustment techniques.
- 22 *Introduction to Educational Psychology* (3)
Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

* Psychology 1 is prerequisite to all other courses in psychology.

- 29 *Child Psychology* (3)
A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.
- 98 *Abnormal Psychology* (3)
The causes, diagnosis, treatment, and prevention of the various types of maladjustments and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science.
- 112 *Adolescent Psychology* (3)
Psychological characteristics and problems peculiar to adolescence, with emphasis on applications of psychology to solution of such problems.
- 125 *Mental Hygiene for Teachers* (3)
The application of psychological principles to classroom procedures for purposes of assisting the teacher to recognize and deal with early symptoms of maladjustment.
- 127 *Employee Counseling* (3)
Employee counseling as a management technique and its contribution to management; a survey of its basic objectives, principles, and procedures.
- 129 *Introduction to Counseling and Guidance* (3)
A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.
- 131 *Psychological Tests* (3)
A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7.
- 134 *Educational Measurement* (3)
The construction and use of the newer types of educational and psychological tests.
- 144 *Personnel Psychology* (3)
The applications of psychology to personnel work in education, business, industry, and government.
- 145 *Principles of Human Relations* (3)
Survey of the psychological principles involved in dealing with individuals and groups.
- 146 *Problems in Human Relations* (3)
The application of psychological principles to understanding and improving personal and group relations. Emphasis will be upon case studies and specific problems drawn from life situations, with important attention to supervisory and administrative relationships. Prerequisite: Psychology 1 (or Psychology 145 for students in the special programs).
- 148 *Psychology of Advertising and Market Research* (3)
The motivational and social dynamics of consumer behavior. Evaluation of the psychological effectiveness of products, media, and advertising and public relations programs. Consideration of current techniques and findings in motivational research.

149 Human Relations in Management (3)

The purpose of the course is to create an awareness of the value and use of human relations in management; and to discuss the procedures and techniques used in applying good human relations to management. Principles of management will be discussed.

151 Social Psychology (3)

The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war.

156 Psychology of Propaganda and Public Opinion (3)

The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare.

225 Seminar: Mental Hygiene (3)

A study of mental health problems with special attention to programs of prevention.

227 Seminar: Counseling and Guidance (3)

Recent developments and current problems in vocational, educational, and personal guidance in various types of agencies with particular reference to education. Prerequisite: educational or psychological measurements and Psychology 129 or the equivalent.

228 Seminar: Techniques of Counseling (3)

An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed.

236 Seminar: Analysis of the Individual for Purposes of Counseling (3)

A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements.

245 Seminar: Employee Motivation and Morale (3)

Application of the principles of primary group functioning and group-centered administration to the problem of motivating employees; building morale, and strengthening human relations. Emphasis is upon use of group dynamics in supervision and leadership.

246 Seminar: Personnel Measurement Techniques (3)

Detailed consideration of interviews, personal data analysis, tests, ratings, and questionnaires in evaluating employability, job proficiency, and worker morale.

247 Applications of Behavioral Research Methods to Personnel Management (3)

Study of the design, methods, and techniques of behavioral research as applied to the problems of personnel administration with special emphasis upon current programs of research and the translation of their results into management action.

299-300 Thesis (3-3)

RELIGION

Executive Officer: Clifton Earl Olmstead, A.B., Th.D., Associate Professor of Religion, Building O, Room 10 (2106 G Street NW.), FEderal 8-0250, Extension 279

191 *Christian Education in the Church* (3)

Principles of religious education; factors conditioning Christian growth; functions of family, church, community, and state.

192 *Christian Education in the Church* (3)

The unified program of the church; worship, study, and service; developing lay educational leadership; housing and equipment; curriculum construction; evaluation of materials; lesson planning and teaching methods.

ROMANCE LANGUAGES AND LITERATURES

Executive Officer: George Elbert McSpadden, Ph.D., Professor of Romance Languages, Building A, Room 23 (2026 G Street NW.), FEderal 8-0250, Extension 425

FRENCH

1-2 *First-year French* (3-3)

A year course: credit is not given for the first half until the second half is completed. For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose.

3-4 *Second-year French* (3-3)

A year course: credit is not given for the first half until the second half is completed. Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Prerequisite: French 1-2 or two years of high school French.

SPANISH

1-2 *First-year Spanish* (3-3)

A year course: credit is not given for the first half until the second half is completed. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Spanish prose.

3-4 *Second-year Spanish* (3-3)

A year course: credit is not given for the first half until the second half is completed. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Prerequisite: Spanish 1-2 or two years of high school Spanish.

SECRETARIAL STUDIES

Executive Officer: Mildred Hollander Shott, A.M., Associate Professor of Secretarial Studies, Monroe Hall, Room 300 (2115 G Street NW.), FEderal 8-0250, Extension 447

1 *Elementary Typewriting* (3)

Fundamental techniques of typewriting, basic styles of business letters, introduction to tabulation, and preparation of general office forms.

2 *Intermediate Typewriting* (3)

The business letter and its arrangement, advanced tabulation, manuscript typing, office forms, stencil cutting, and legal documents.

11 *Elementary Shorthand and Transcription* (3)

A study of the principles of Gregg shorthand correlated with dictation and transcription. *Minimum* dictation speed of 60 words a minute attained.

12 *Intermediate Shorthand and Transcription* (3)

Review of the principles of Gregg Shorthand. Dictation and transcription of general and specialized business subjects. *Minimum* dictation speed of 80 words a minute attained. Prerequisite: Secretarial Studies 11.

15 *Advanced Shorthand, Typewriting, and Transcription* (3)

Dictation and transcription involving vocabularies in specific businesses. *Minimum* speed of 100 words a minute attained in dictation.

16 *Secretarial Shorthand, Typewriting, and Transcription* (3)

Dictation and transcription involving vocabularies used in the legal and medical professions. *Minimum* dictation speed of 120 words a minute attained.

51 *Business Correspondence* (3)

Development of the technique of effective communication with reference to business letters and forms. Survey and analysis of current business literature.

54 *Secretarial Practice* (3)

A thorough study of secretarial problems and procedures. Practice in the use of secretarial equipment and supplies. The study of secretarial personality and office relationships.

SLAVIC LANGUAGES AND LITERATURES

Executive Officer: Helen Bates Yakobson, B.S., Associate Professor of Russian.
Building M, Room 12 (716 Twenty-first Street NW.), FEderal 8-0250. Extension 275 and 496

1-2 *First-year Russian* (3-3)

A year course: credit is not given for the first half until the second half is completed. A beginner's course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice.

3-4 *Second-year Russian* (3-3)

A year course: credit is not given for the first half until the second half is completed. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics.

9-10 *Russian Conversation* (3-3)

Listening comprehension and oral practice.

103-4 *Scientific Russian* (3-3)

Reading and translation of technical texts.

SOCIOLOGY AND ANTHROPOLOGY

Executive Officer: Harold Loran Geisert, Ph.D., Professor of Sociology and Anthropology, Building X, Room 12 (2107 H Street NW.), Federal 8-0250, Extension 387

1-2 *Man in Modern Society** (3-3)

Development of culture and personality, the impact of groups and institutions on man's social behavior. Factors producing social problems; individual, community, national and international disorganization.

126 *Urban Sociology* (3)

The place of the city in the larger society: growth of the city, problems of urban living, group life, personality, urban housing, and city planning. Includes consideration of suburban development.

127 *Community Organization* (3)

Principles common to communities throughout the world: social interaction and social disorganization, population growth and community structure, spatial organization, community change.

131 *Social Institutions* (3)

Functional analysis of basic social institutions: family, education, religion, and state in the structure of American society.

132 *Courtship and Marriage* (3)

Dating and courtship as social processes, reasons for marriage, marriage laws, mate selection, factors in marital adjustment; prediction and counseling.

135 *Juvenile Delinquency* (3)

Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders.

136 *Criminology* (3)

Nature and distribution of crime, police and court systems, prisons and reformatories, treatment and prevention of crime.

142 *Race and Cultural Contacts* (3)

The origins of races and an examination of the influence of culture on racial composition. Includes the relationship of race to religious, national, and ethnic groups.

221 *Seminar: Current Trends in Sociology* (3)

Analysis and evaluation of recent developments in sociology, and an appraisal of the role of systematic theory in sociology.

SPEECH

Executive Officer: Lubin Poe Leggette, A.M., Ed.D., Depew Professor of Speech, Lisner Auditorium, Room 2 (730 Twenty-first Street NW.), Federal 8-0250, Extension 293

* Sociology and Anthropology 1 or 51 is prerequisite to all other courses in Sociology and Anthropology.

1 *Effective Speaking* (3)

Preparation and delivery of extempore speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, \$2.

2 *Persuasive Speaking* (3)

A continuation of Speech 1, which is prerequisite, with emphasis on speech composition and elementary principles of persuasion.

11 *Voice and Diction* (3)

Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of the sounds of English, the standards of speech. Class instruction in the problems of rate, volume, pitch, and quality. Recording fee, \$4.

111 *Effective Speech Communication** (3)

This course stresses principles of effective speech communication, including practice in the organization, delivery, and evaluation of presentations commonly encountered in management situations.

121 *Group Discussion and Conference Leadership* (3)

The process of thinking and problem solving in committees and small groups, and the methods of leading discussions and conferences. Prerequisite: 6 hours of speech or the permission of the instructor.

169-70 *Creative Dramatics and Children's Theater* (3-3)

A study of creative dramatics and its use as a learning tool, with problems and experience in producing children's plays.

STATISTICS

Executive Officer: Harold Frederick Bright, Ph.D., Professor of Statistics, Hall of Government, Room 401 (710 Twenty-first Street NW.), Federal 8-0250, Extension 296

51 *Introduction to Business and Economic Statistics*† (3)

Lecture (2 hours), laboratory (2 hours). Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

52 *Mathematics of Finance*‡ (3)

Lecture (2 hours), laboratory (2 hours). Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

58 *Mathematics of Business Administration* (3)

Lecture (2 hours), laboratory (2 hours). Study and problems in procedures of interest and discount, annuities, valuation of stocks and bonds, sinking

* This course can be adapted to the needs of a specific group.

† Statistics 51 is offered only on campus. However, Statistics 101 and 102: *Basic Principles of Statistical Methods, I and II* (3-3), which is offered off campus, may be substituted.

‡ Statistics 52 is offered only on campus. However, Statistics 58, *Mathematics of Business Administration* (3), which is offered off campus, may be substituted.

funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra. (This course offered off campus only.)

91 *Principles of Statistical Methods* (3)

Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes.

101 *Basic Principles of Statistical Methods I* (3)

Variables and attributes, averages and dispersion, elementary principles of sampling, introduction to the making of statistical decisions. (This course is offered both on and off campus.)

102 *Basic Principles of Statistical Methods II* (3)

Continuation of Statistics 101 and includes topics in analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 101, or permission of the instructor. (This course offered off campus only.)

106 *Factor Analysis* (3)

Matrix theory as applied to factor analysis, introduction to the concepts of factor analysis and their utility in various phases of research. Prerequisite: Statistics 53 or the equivalent. Laboratory fee, \$9.

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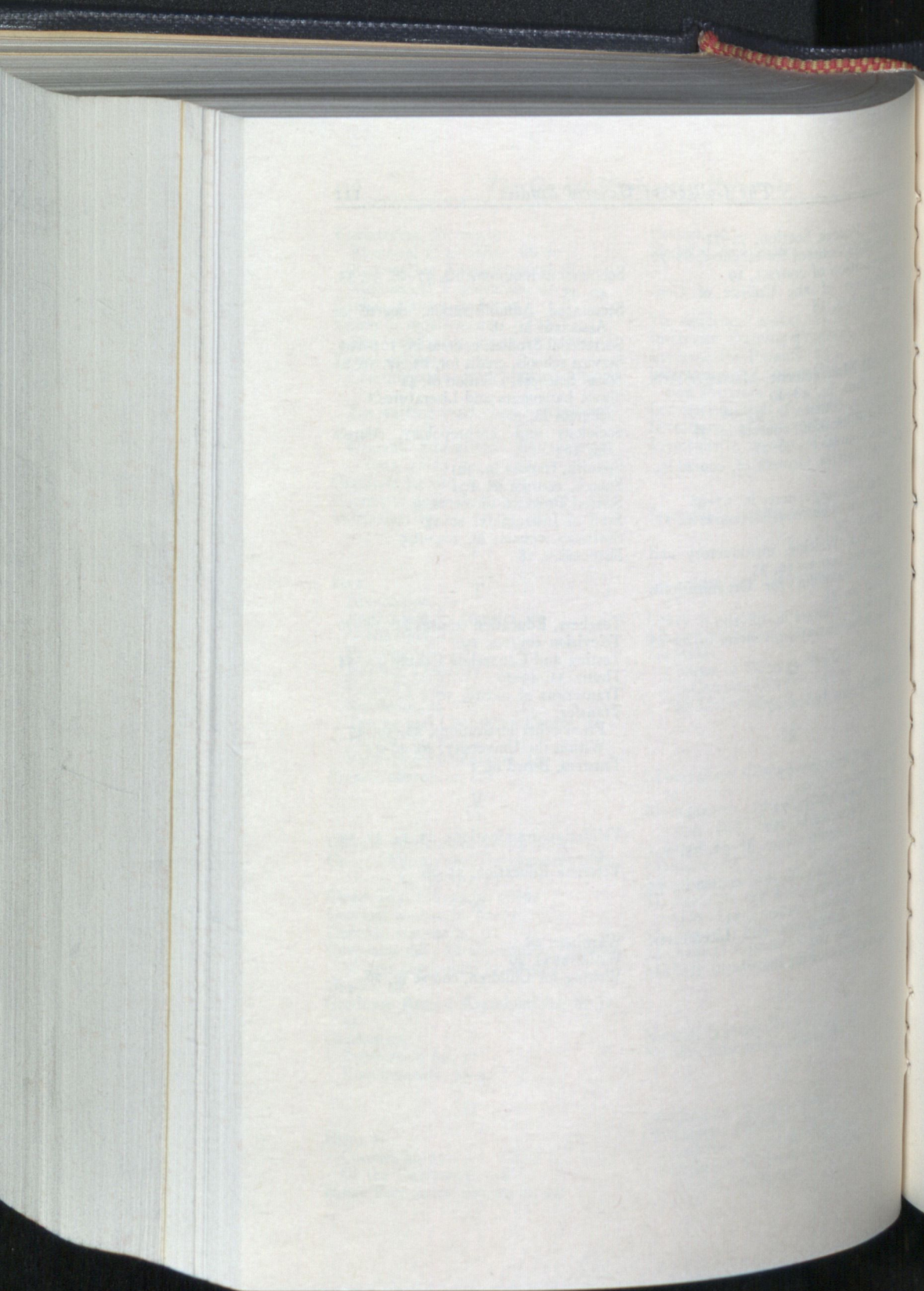
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THE GEORGE WASHINGTON UNIVERSITY
1821

The Junior College
1930

Columbian College (the Senior College)
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The School of Education
1907

The School of Government
1928

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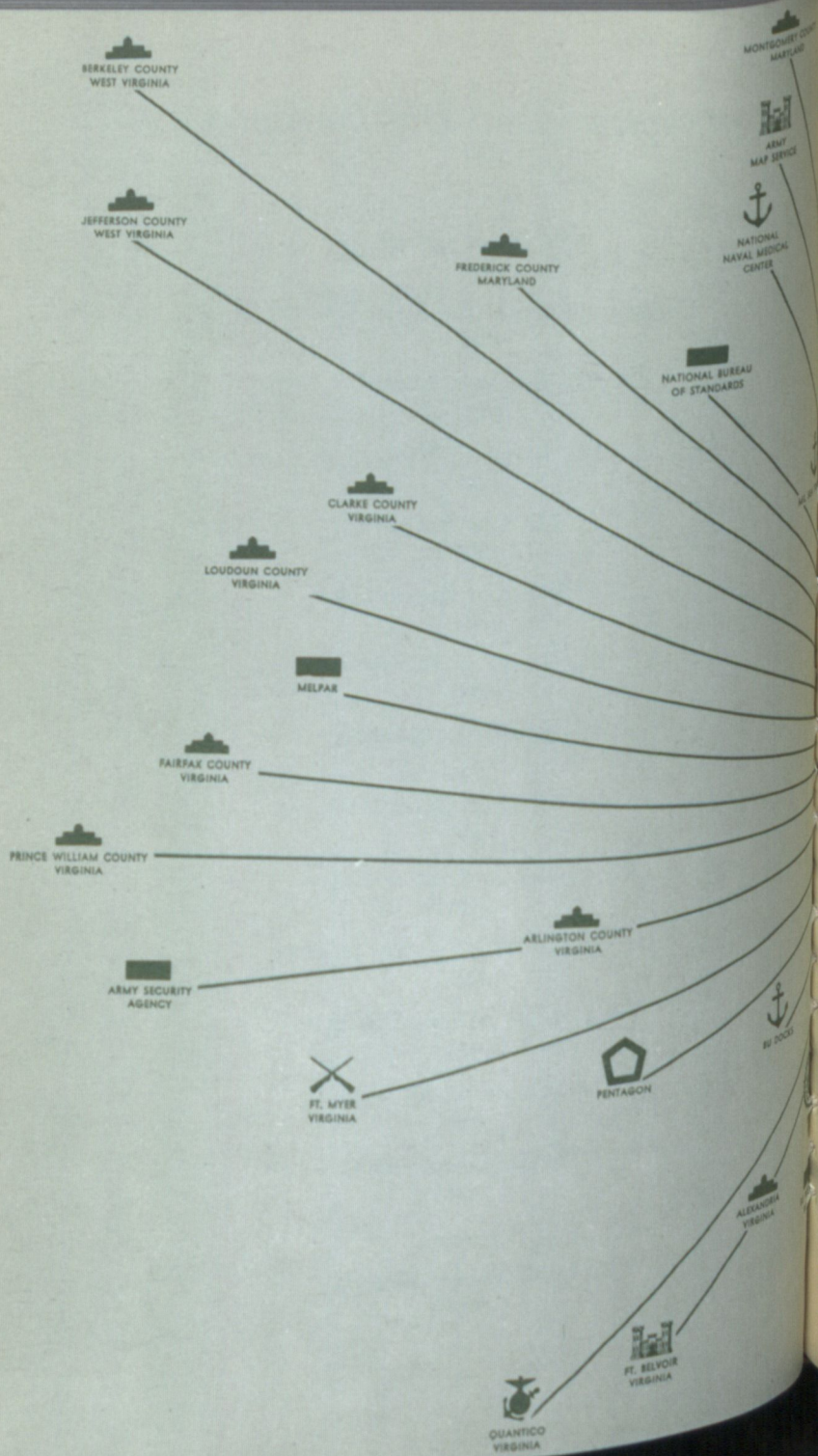
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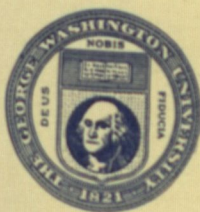


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1960-61



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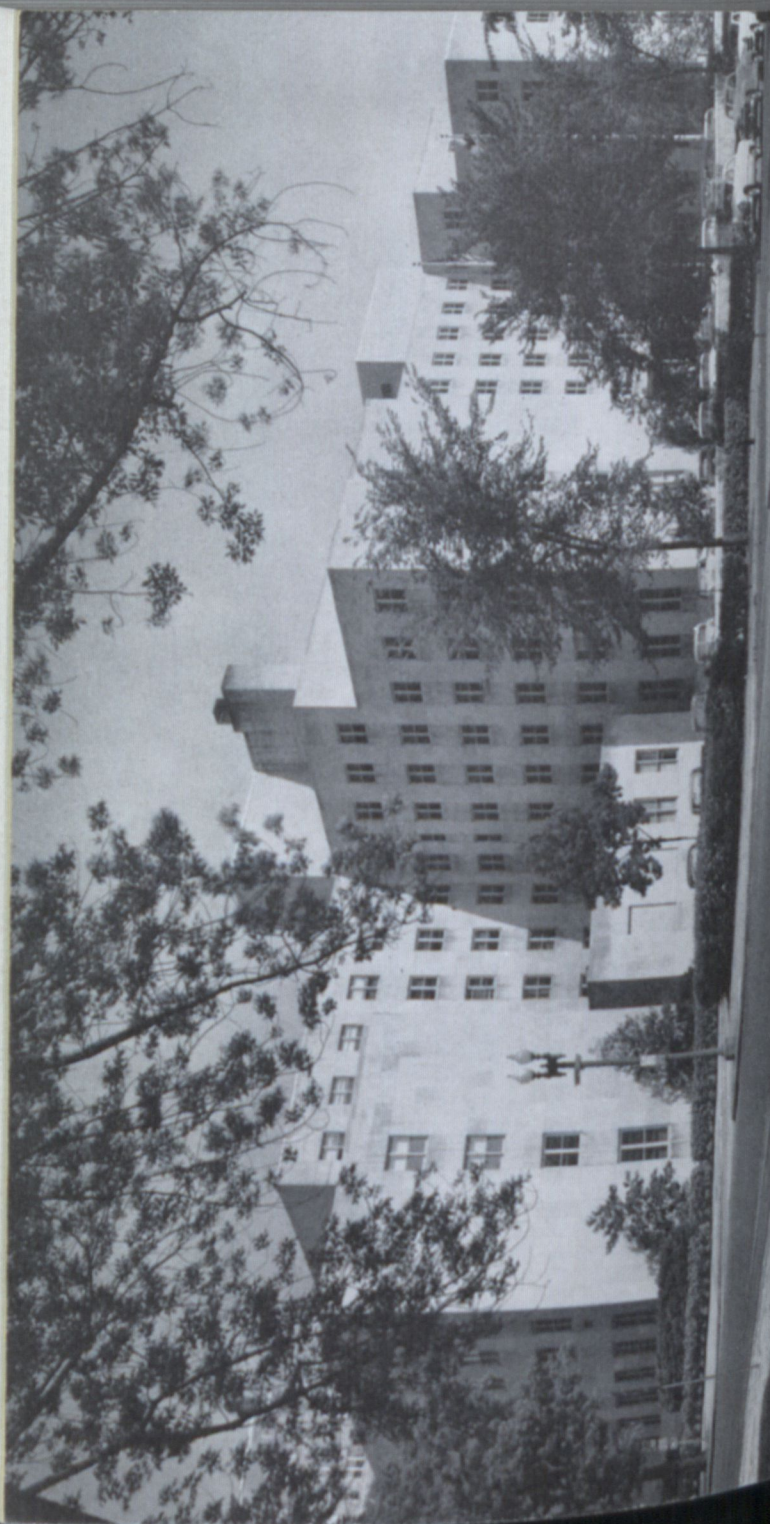
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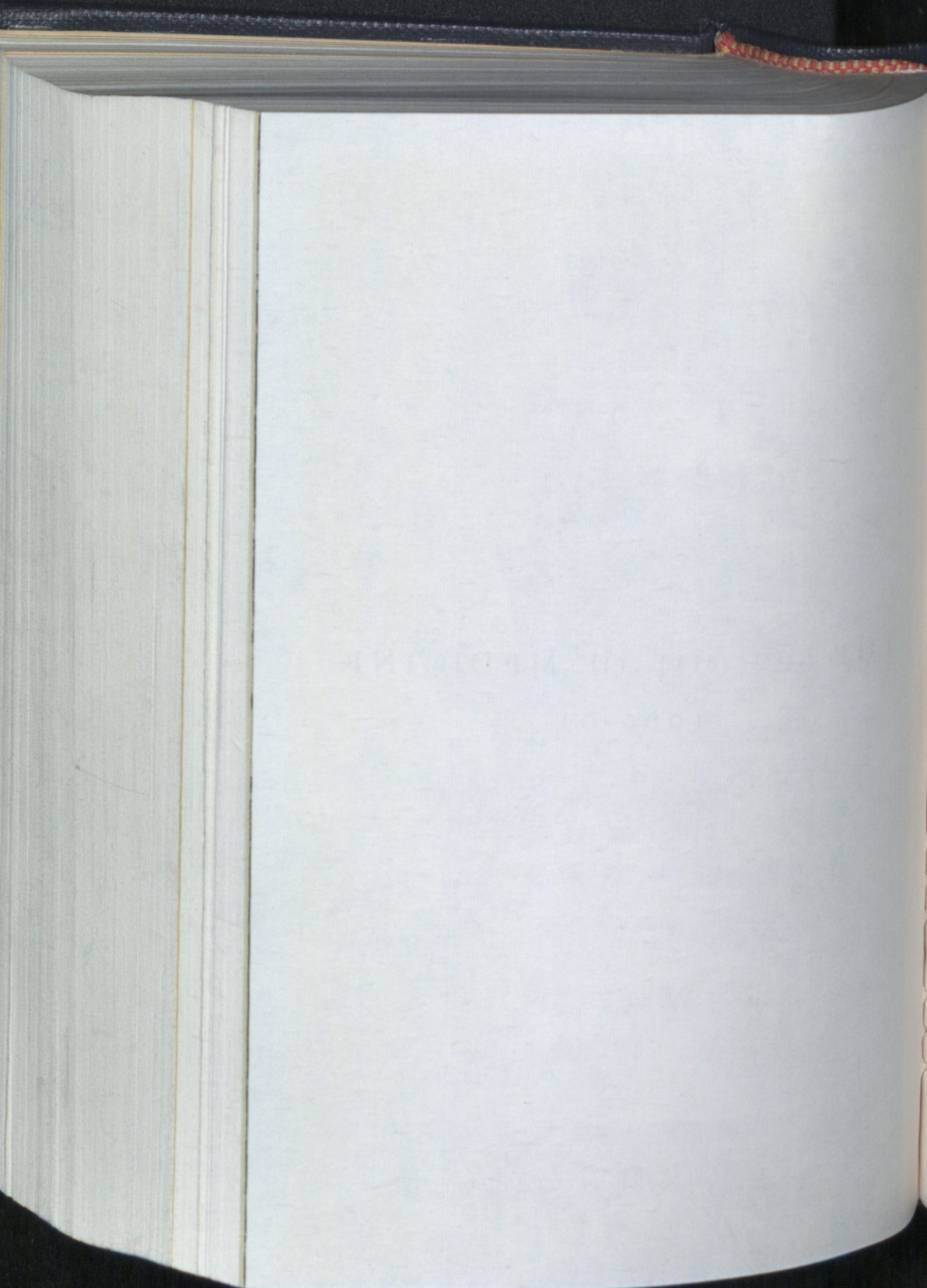
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THE SCHOOL OF MEDICINE

WASHINGTON, D. C.

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THE UNIVERSITY



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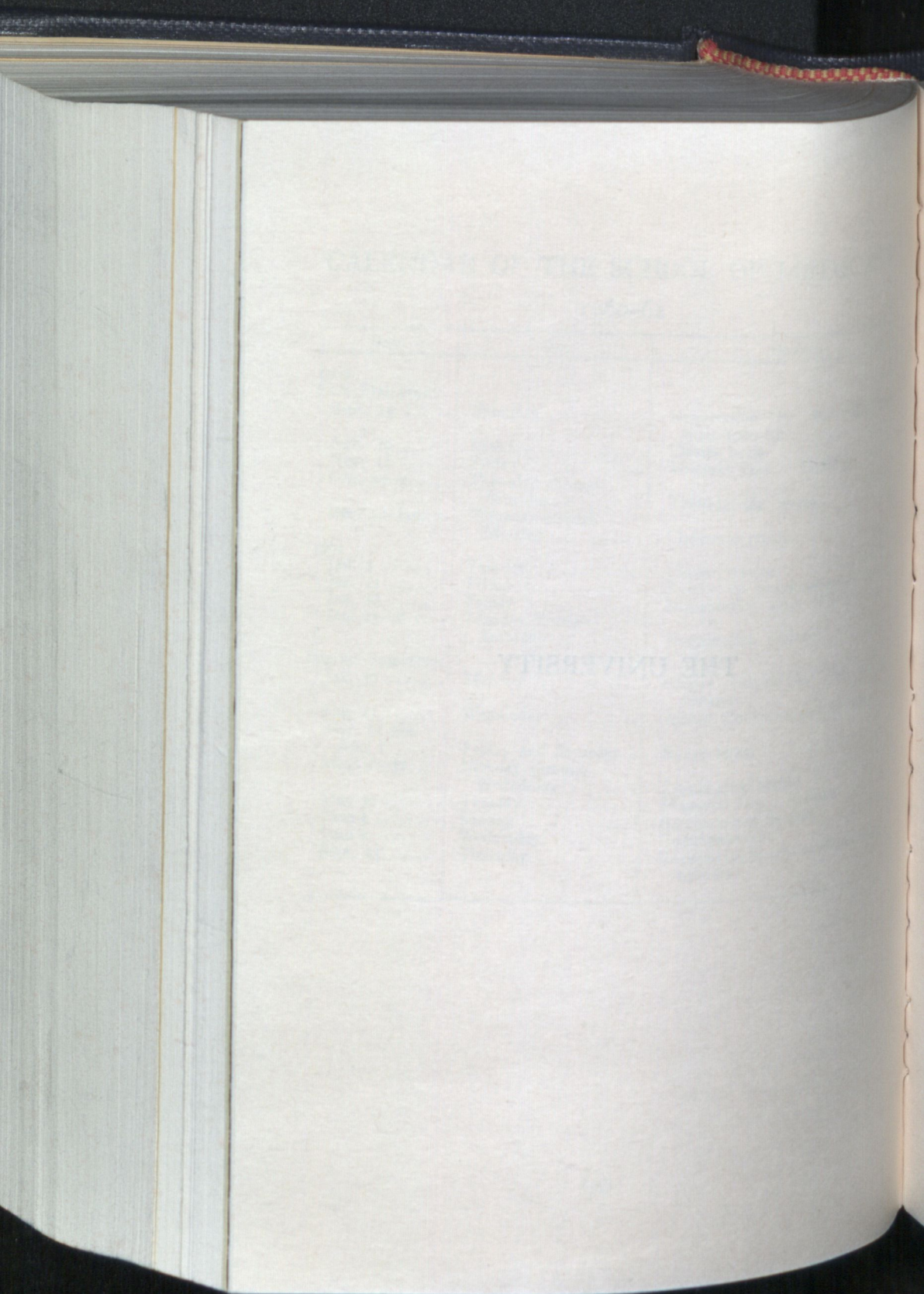
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CALENDAR OF THE SCHOOL OF MEDICINE

1960-61

Date	Day	Occasion
1960		
FALL SEMESTER:		
Sept. 15	Thursday	Registration for the academic year 1960-61
Sept. 19	Monday	Classes begin
Nov. 11	Friday	Veterans Day. Holiday
Nov. 24-26	Thursday through Saturday	Thanksgiving recess
Dec. 22-Jan. 2.	Thursday through Monday	Christmas recess
1961		
Jan. 3	Tuesday	Classes resume
Jan. 13	Friday	Tuition for spring semester due
Jan. 20	Friday	Inauguration Day. Holiday
Jan. 23-28	Monday through Saturday	Examination period
SPRING SEMESTER:		
Jan. 30	Monday	Classes resume for the spring semester
Feb. 22	Wednesday	Winter Convocation. Holiday
Mar. 31 and Apr. 1	Friday and Saturday ..	Easter recess
May 22-31 ...	Monday through Wednesday	Examination period
May 30	Tuesday	Memorial Day. Holiday
June 4	Sunday	Baccalaureate Sermon
June 7	Wednesday	Commencement
Sept. 14	Thursday	Registration for the academic year 1961-62

THE UNIVERSITY



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* For the academic year 1959-60.

THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

The George Washington University operates under a charter granted by an act of Congress of February 9, 1821, to Columbian College in the District of Columbia. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The University as it is now organized consists of the Junior College, comprising the work of the freshman and sophomore years; Columbian College, the senior college of liberal arts, which offers work leading to the Bachelor's and Master's degrees; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools, which include Medicine, Law, Engineering, Pharmacy, Education, and Government; the College of General Studies; the Division of University students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

The George Washington University is a privately endowed University located on a well planned campus in the center of Washington within a few blocks of the White House. The government and educational management of the University are vested in a self-perpetuating Board of Trustees, with the President of the University serving as an *ex officio* member of the Board.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The School of Medicine has had continuous approval by the Council

on Medical Education of the American Medical Association and the Association of American Medical Colleges. The degree of the School of Medicine is recognized by all State Examining Boards.

LOCATION

The University is in downtown Washington within a few blocks of the White House and the Federal Triangle of Government buildings, which house many of the departments of the Federal Government, and such museums of especial interest to medical students as the Smithsonian Institution, the National Museum, and the Botanic Gardens.

The history of the American West is a story of discovery and conquest. It is a story of the pioneers who first explored the vast, uncharted territories of the continent. It is a story of the settlers who followed them, seeking new lands and new opportunities. It is a story of the struggles and triumphs of a people who built a great nation out of a wilderness.

CHAPTER I

The first explorers of the American West were the Spanish. They were the first to cross the great desert and to reach the Pacific Ocean. They were the first to discover the great river which flows from the mountains to the sea. They were the first to build a great empire out of a wilderness. They were the first to show the world that the American West was a land of great promise and great opportunity.

The first settlers of the American West were the French. They were the first to build a great empire out of a wilderness. They were the first to show the world that the American West was a land of great promise and great opportunity.

The first explorers of the American West were the English. They were the first to cross the great desert and to reach the Pacific Ocean. They were the first to discover the great river which flows from the mountains to the sea. They were the first to build a great empire out of a wilderness.

The first settlers of the American West were the Americans. They were the first to build a great empire out of a wilderness. They were the first to show the world that the American West was a land of great promise and great opportunity.

The first explorers of the American West were the Americans. They were the first to cross the great desert and to reach the Pacific Ocean. They were the first to discover the great river which flows from the mountains to the sea. They were the first to build a great empire out of a wilderness.

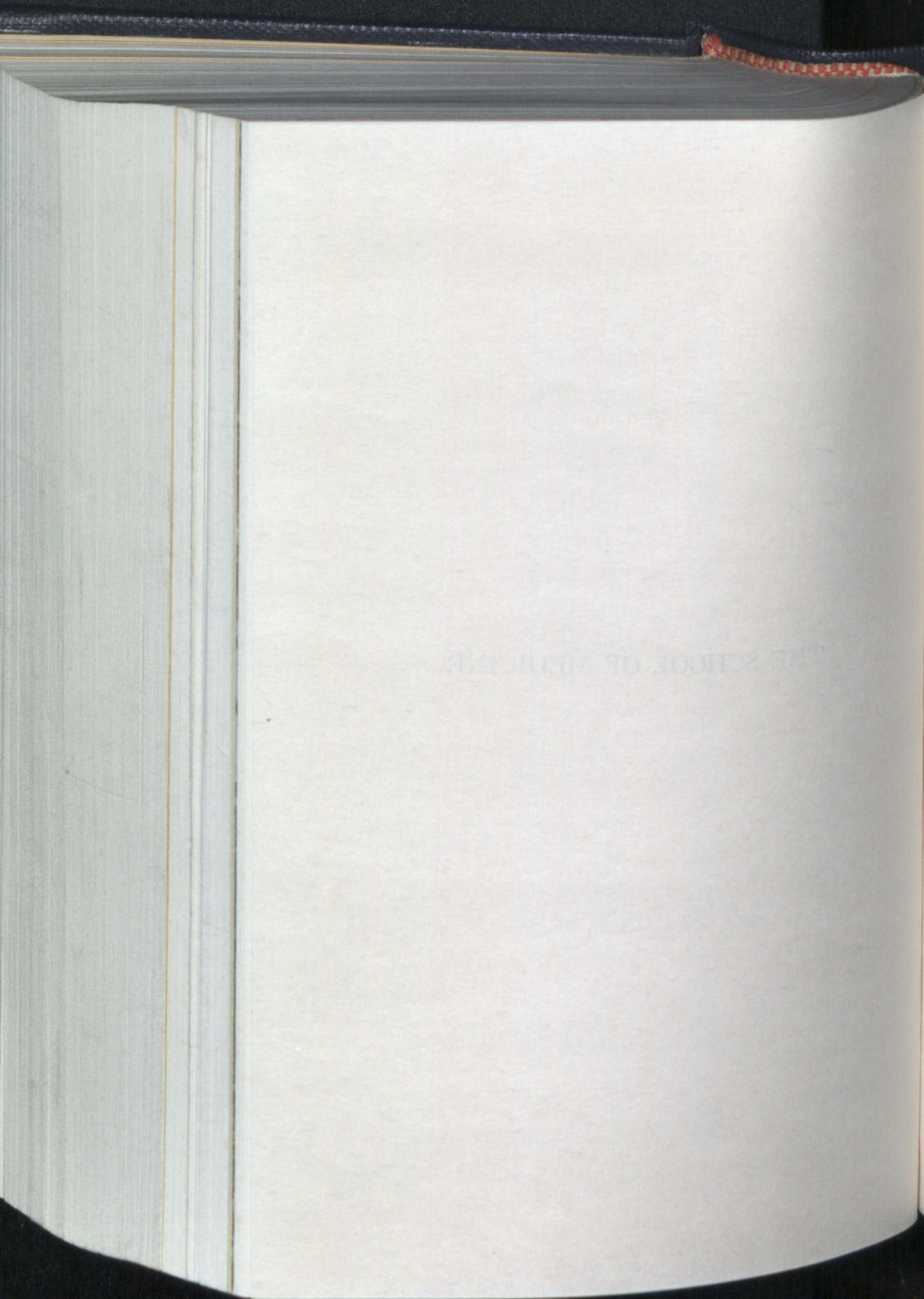
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CHAPTER II

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THE SCHOOL OF MEDICINE



THE SCHOOL OF MEDICINE

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ASSISTANTS IN RESEARCH AND INSTRUCTION

ARTURO AGUILAR, M.D.

Fellow in Anesthesiology

IRWIN ARDAM, A.B., M.D.

Fellow in Medicine (Cardiovascular Diseases)

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STANLEY BIALEK, B.S., M.D.

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VICTOR CORONHO, M.D.

Fellow in Medicine

STEPHEN WILLIAM DEJTER, A.B., M.D.

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RALPH RICHARD GRAY, A.B.

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- SANG HO JIN, M.D.
Fellow in Anesthesiology
- ARNOLD RAYMOND KAPLAN, Ph.D.
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Assistant in Anesthesiology

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Jean Beatrice Bernheimer, *Technician in Bacteriology*
James Francis Delaney, Jr., *Photographer in Medical School Photographic Laboratory*
Peter Antal Pasztory, *Technician in Pathology*
Jno Deshon Randall, *Technician in Neurology and Neurological Surgery*
Dorothy Harris, *Technician in Medicine*
Caroline Amelia Woodruff, M.S., *Technician in Anatomy*
Kenneth Kelly, *Technician in Biochemistry*

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Virginia Sutton Ringness, *Departmental Secretary in Obstetrics and Gynecology*
Louree Crossfield, A.B., *Assistant to the Associate Dean, School of Medicine*
Patricia Latinski Wheeler, *Secretary, Department of Anatomy*
Ruth Karstens, *Departmental Secretary in Pathology*
Ruth Murphy Morgan, B.S., *Departmental Secretary in Medicine*
Jane Eglon Morris, *Departmental Secretary in Surgery*
Virginia Louise Jones, *Secretary, Department of Obstetrics and Gynecology*
Myrtle Augustin, A.B., *Secretary, Department of Psychiatry*
Patricia Murphy, *Secretary, Office of the Dean*
Ruth Agnes Linson Jackson, *Clerk-Typist, Office of the Dean*
Joan Dickens Gunter, *Secretary, Office of the Dean*
Lucinda Merrill Mathis, *Secretary, Department of Physiology*

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Francisco Paolo Ferraraccio, B.S., *Assistant Administrator*
John James Bordelon, A.B., *Administrative Assistant*
Madeline Lenora Brown, R.R.L., A.B., *Medical Record Librarian*
Henry Paul Bunting, B.S., *Assistant Comptroller*
Franklin Dero Cooper, M.S., *Chief Pharmacist*
Margaret Emanuel, R.N., M.S., *Director of Nursing*
William Philip Hendricks, *Chief, Admissions Department*
Thelma Moore, *Chief, Telephone Department*
Louise O'Neal, R.N., A.B., *Assistant Director of Nursing*
Raymond Francis Whitehair, *Administrative Assistant, Outpatient Department*
Francis William Santelli, *Executive Housekeeper*
Frank Leonard Sasher, *Manager, Laundry Department*
Joanne Louise Styer, B.S., *Chief Therapeutic Dietitian*
Robert Hamilton Thompson, B.S., *Director of Food Service*
Laura Beasley Brown, *Secretary, Office of the Medical Director*
Mary Bernadette Lansinger, *Secretary, Office of the Administrator*

THE SCHOOL OF MEDICINE*

THE FACULTY†

John Parks, M.S., M.D., *Dean of the School of Medicine*
Angus MacIvor Griffin, Ph.D., *Associate Dean of the School of Medicine*
Alvin Edward Parrish, M.D., *Associate Dean of the School of Medicine*

Harry Ford Anderson, M.D., *Professor of Dermatology and Syphilology*

John Parks, M.S., M.D., *Professor of Obstetrics and Gynecology*

Brian Blades, A.B., M.D., *Professor of Surgery*

Paul Kenneth Smith, Ph.D., *Professor of Pharmacology*

James Winston Watts, B.S., M.D., *Professor of Neurological Surgery*

Chester Elwood Leese, Ph.D., *Fry Professor of Physiology*

Thomas McPherson Brown, A.B., M.D., *Eugene Meyer Professor of*

Medicine
Angus MacIvor Griffin, Ph.D., *Professor of Bacteriology*

Ronald Atmore Cox, A.B., M.D., *Professor of Ophthalmology*

Thomas Martin Peery, A.B., M.D., *Professor of Pathology*

William Woodrow Stanbro, M.D., *Professor of Radiology*

Charles Samuel Wise, B.S., M.D., *Professor of Physical Medicine and*

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Carleton Raymond Treadwell, Ph.D., *Professor of Biochemistry*

Charles Seymour Coakley, M.D., *Professor of Anesthesiology*

†Ira Rockwood Telford, Ph.D., *Professor of Anatomy*

Paul Calabresi, Ph.D., *Professor of Anatomy*

Harold Stevens, Ph.D., M.D., *Professor of Neurology*

Charles Adrian Michael Hogben, M.D., Ph.D., *Professor of Physiology*

Robert Henry Barter, B.S., M.D., *Professor of Obstetrics and Gyne-*

cology
Harold George Mandel, Ph.D., *Professor of Pharmacology*

Herbert Leonard Ley, Jr., M.D., M.P.H., *Professor of Bacteriology*

Leon Yochelson, A.B., M.D., *Professor of Psychiatry*

Ernest Alfred Watson Sheppard, M.D., C.M., *Clinical Professor of*

Ophthalmology
William Staton Anderson, A.B., M.D., *Clinical Professor of Pediatrics*

Henry Luran Darner, A.B., M.D., *Clinical Professor of Obstetrics and*

Gynecology
Charles Robert Lee Halley, A.B., M.D., *Clinical Professor of Medicine*

* Faculty and committee members listed here are for the academic year 1959-60.

† The President of the University, the Dean of Faculties of the University, and the Registrar of the University are members of the Faculty.

‡ On sabbatical leave spring semester 1959-60.

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 Frank Nelson Miller, Jr., B.S., M.D., *Associate Professor of Pathology*
 Alvin Edward Parrish, M.D., *Associate Professor of Medicine*
 Leon Richard Culbertson, B.S., M.D., *Associate Clinical Professor of Urology*
 James Jerry McFarland, Jr., B.S., M.D., *Associate Clinical Professor of Otolaryngology*
 Jack Louis Levine, M.D., *Assistant Clinical Professor of Otolaryngology*
 Victor Frederick Ludewig, A.B., B.S., *Administrator of the University Hospital*

COMMITTEES *

THE DEAN'S COUNCIL

Brian Blades
 James Winston Watts
 Thomas Martin Peery

Paul Kenneth Smith
 Angus MacIvor Griffin
 Alvin Edward Parrish

Victor Frederick Ludewig

COMMITTEE ON ADMISSIONS

Harold George Mandel
 Joseph Eugene Rankin

Paul Calabrisi, *Chairman*
 Frank Nelson Miller, Jr.
 William Prentiss McKelway

COMMITTEE ON CURRICULUM

Thomas Martin Peery, *Chairman*
 Carleton Raymond Treadwell
 Monroe James Romansky
 James Glover Sites

Ira Rockwood Telford
 Charles Adrian Michael Hogben
 James Richard Thistlethwaite

COMMITTEE ON SCHOLARSHIP

Ira Rockwood Telford, *Chairman*
 Brian Blades
 Thomas Martin Peery

Thomas McPherson Brown
 Charles Adrian Michael Hogben

COMMITTEE ON RESEARCH

Angus MacIvor Griffin, *Chairman*
 Paul Kenneth Smith
 Harold Stevens
 Howard Clemeth Pierpont

Carleton Raymond Treadwell
 Herbert Leonard Ley, Jr.
 John McCallum Evans

* The Dean and Associate Deans of the School of Medicine are members ex officio of all committees.

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Harold George Mandel
Seymour Alpert

Mary Louise Robbins
Stewart William Bush

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Brian Blades
Robert Henry Barter
Alvin Edward Parrish

Charles Seymour Coakley
Leon Yochelson
Victor Frederick Ludewig

COMMITTEE ON APPOINTMENTS AND PROMOTIONS

Brian Blades, *Chairman*

Paul Kenneth Smith
Thomas Martin Peery

Angus MacIvor Griffin
Alvin Edward Parrish

ADVISORY COMMITTEE ON CANCER RESEARCH

Paul Kenneth Smith, *Chairman*

Louis Katz Alpert
William Newman
Charlotte Patricia Donlan

Mary Louise Robbins
Calvin Trexler Klopp
Jeremiah Keith Cromer

John Martyn Bailey

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Charles Samuel Wise, *Chairman*

Thomas McPherson Brown
John Pletch Adams

John McCallum Evans
James Richard Thistlethwaite

Irene Gorski Tamagna

GENERAL INFORMATION

INTRODUCTION

The School of Medicine of The George Washington University was opened in March 1825. Of the medical schools now in existence in the United States, it is the eleventh in chronological order of founding. The University Hospital and Dispensary were established in 1898 as a part of the organization of the School. The new George Washington University Hospital was opened in 1948, and the Cancer Clinic building was completed in 1954. Additional clinical facilities are used at the District of Columbia General Hospital, Children's Hospital, St. Elizabeths Hospital, and Mt. Alto Veterans Administration Hospital. The School of Medicine maintains close affiliation not only with the various divisions

of the University, but also with the numerous medical research and scientific establishments of the federal government in the Nation's Capital. Washington provides world renowned library facilities, comprehensive museums, and excellent recreational facilities which are available to students.

OBJECTIVES

The purpose of the School of Medicine is to prepare men and women in the art and science of medicine to meet the health needs of a growing, ever changing society. It is the responsibility of the School of Medicine to provide its students with a systematic plan of instruction in the basic medical sciences, with well guided clinical experience, with opportunities for expression in research, and with a philosophy in keeping with the highest ethics of the profession.

For undergraduates the aims of the School of Medicine are (1) to select students of superior ability and character; (2) to teach the theoretical principles, laboratory techniques, and clinical applications of the medical sciences; and (3) to provide a diversity of clinical experience through well supervised clerkships in University, public, and federal hospitals providing facilities for all specialized fields of medicine.

The aims of the School of Medicine in graduate and post graduate education are (1) to provide well planned services for internship and resident training in both general and specialized practices; (2) to direct an expanding program of applied research, integrated with teaching at the School of Medicine, and in keeping with the growth of Washington as one of the world's great centers of medical investigation; and (3) to provide postgraduate instruction in recent advances in medicine.

To achieve these objectives the School of Medicine has developed a progressive plan of instruction and a balanced, comprehensive curriculum. To carry out the program the University seeks to maintain a faculty of adequate size and outstanding ability, making use of facilities which provide exceptional opportunities for research and clinical training.

PLAN OF INSTRUCTION

The curriculum is a progressive one, beginning with basic medical science and expanding to include the more complex aspects of the prevention of disease and care of the sick. The teaching program is organized under the various departments of the School of Medicine. (See "Courses of Instruction", page 71.)

The schedule for the first year begins with an orientation week designed to introduce the new students to the Faculty, to the upperclassmen, and to the environment for their medical education. The students meet for informal panel discussions with upperclassmen and members of the Faculty on such subjects as curriculum, medical terminology, use of

library facilities, ethics and aims of the medical profession, and student health.

First year instruction is given in anatomy, biochemistry, and physiology using the classroom and laboratory facilities of the School of Medicine. Early in their medical careers students are encouraged to participate in research. Practical problems in patient care are introduced at conferences in the University Hospital.

Having completed the preliminary study of structure and function of the normal body, the student progresses in the second year to a consideration of disease processes and mechanisms. The various microbial agents capable of causing disease are studied in the course in microbiology, and the effect of these and other harmful substances upon the body are studied in the course in pathology. The modes of action of various therapeutic agents are considered in the course in pharmacology. Introductory lectures and demonstrations in the clinical sciences are given during the second semester in order to prepare the student for the responsibilities of the following year.

In the third year the student is assigned to the District of Columbia General Hospital for lectures, conferences, and clinical studies. He serves in the various divisions of the hospital assisting in the preparation of clinical records and performing certain clinical laboratory examinations. He learns to carry out the usual ward procedures and to use certain diagnostic and therapeutic instruments. During this period instruction is individual or in small groups. The instructor reviews the student's observations at the bedside and guides him in the development and application of his knowledge.

During the summer period following the third year each student is required to spend eight weeks in one of the clinical facilities of the School of Medicine.

In the fourth year the student's responsibility for inpatient care continues and enlarges, but at least an equal part of his time is spent in the study and care of clinic patients. The University Hospital, the District of Columbia General Hospital, Children's Hospital, Mount Alto Veterans Administration Hospital, and St. Elizabeths Hospital provide the student with experience in many fields. In this final year of formal medical education stress is placed upon the total patient and his environment so that emotional and economic as well as physical factors may be considered in the restoration of the individual to a state of health and happiness.

Upon satisfactory completion of the four-year course of the School of Medicine, the student is well prepared for graduate training leading to a career in general or specialty practice, research, medical education, or government service.

THE CURRICULUM

Subject	Lecture	Laboratory or Clerkship	Conference	Total
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FIRST YEAR

Gross Anatomy	85	210	—	295
Embryology and Histology	60	120	—	180
Neuroanatomy	32	56	—	88
Biochemistry	76	180	32	288
Physiology	112	152	32	296
Biostatistics	16	—	—	16
Disaster Medicine	16	—	—	16
Introductory Medical Psychology	16	—	—	16
Psychopathology	16	—	—	16
Total	429	718	64	1,211

SECOND YEAR

Bacteriology	64	144	16	224
Pathology	64	136	32	232
Pharmacology	40	80	24	144
Physical Diagnosis	16	96	—	112
Psychiatry	32	48	—	80
Clinical Microscopy	16	32	—	48
Medicine	48	—	—	48
Surgery	32	—	—	32
Hygiene	32	—	—	32
Pediatrics	32	—	—	32
Neurology	32	—	—	32
Obstetrics	16	—	—	16
Radiology	16	—	—	16
Forensic Pathology and Medical Juris- prudence	16	—	—	16
Dermatology	16	—	—	16
Total	472	536	72	1,080

Subject	Lecture, Conference, or Clinic	Laboratory or Clerkship	Total
THIRD YEAR			
Anesthesiology	16	—	16
Clinical Pathological Conference	16	—	16
Medicine	64	240	304
Medical Laboratory	—	60	60
Neurology	16	60	76
Obstetrics and Gynecology	96	120	216
Ophthalmology	16	—	16
Pediatrics	32	120	152
Physical Medicine	16	—	16
Psychiatry	16	—	16
Radiology	16	—	16
Surgery	16	—	16
Otolaryngology	112	240	352
Admitting and Emergency	16	—	16
Therapeutic Conference	—	120	120
Urology	32	—	32
Total	16	—	16
	480	960	1,440

SUMMER CLERKSHIP

Medicine, Surgery, Obstetrics and Gynecology or Pediatrics—eight weeks between third and fourth years.

FOURTH YEAR

Cancer Clinics	—	120	120
Clinical Pathological Conference	28	—	28
Forensic Medicine	12	—	12
Medicine	—	360	360
Obstetrics and Gynecology	—	240	240
Pediatrics	28	240	268
Psychiatry	—	120	120
Public Health Practice	—	—	—
Surgery	5	—	5
Surgical Anatomy	—	360	360
Surgical Pathology	15	—	15
Total	12	—	12
	100	1,440	1,540

EQUIPMENT AND FACILITIES

Medical School Building.—The building housing the School of Medicine is a five-story structure with lecture rooms, classrooms, students' rooms, and the following laboratories: anatomy; bacteriology, hygiene, and preventive medicine; biochemistry; pathology; pharmacology; and physiology.

They are fully equipped to enable students to pursue adequately the laboratory courses and to acquire the technical skill necessary in modern clinical and investigative work.

Research and Administration Building.—The Research Building houses special laboratories for graduate and staff research in the departments of Anatomy; Biochemistry; Pharmacology; Physiology; and Bacteriology, Hygiene, and Preventive Medicine. Special facilities are provided for the study of radio-active compounds, for tissue-culture techniques, and for virologic procedures. Selected students are invited to participate in certain aspects of the research program either on a volunteer basis or with the support of special Research Scholarships.

On the first floor, the west wing is occupied by a modern medical library; the east wing houses the administrative offices of the School of Medicine. Photographic laboratories and other facilities for audiovisual aids to education are on the second floor.

Medical Library.—The Medical Library in well-equipped quarters on the first floor of 1339 H Street NW., contains 19,400 carefully selected volumes, including the new medical works and the principal medical journals.

Interlibrary loan service is maintained with other medical and scientific libraries.

The Medical Library is open from 9:00 A.M. to 10:00 P.M. each class day, Monday through Friday, and from 9:00 A.M. to 5:00 P.M. Saturday.

A branch of the Medical Library is maintained in the University Hospital for the use of the resident physicians, interns, and students. It is open Monday through Friday, 1:00 to 5:00 P.M. and 6:00 to 9:00 P.M. During the academic year the library is also open Saturday and Sunday from 1:00 to 5:00 P.M.

The George Washington University Hospital.—This 420-bed hospital is staffed and directed by the Faculty of the George Washington University School of Medicine. It provides excellent clinical opportunity for the instruction of medical students. Practically every specialty in the fields of medicine and surgery has assigned space and equipment in both the outpatient department and the bed-patient section of this modern hospital.

GOVERNMENT MUSEUMS

The Armed Forces Institute of Pathology, on the grounds of Walter Reed Army Medical Center, affords unexcelled opportunity for study of conditions met in general medicine and surgery as well as those of special military significance. Its collection of anatomical and pathological specimens comprises material received from all areas of the world and is unequaled in this country. The Museum of Hygiene, the National Museum, the Smithsonian Institution, the Botanic Gardens, and the various collections of the Department of Agriculture all afford opportunity for study of materials of special interest in various areas of Medicine and its allied sciences.

CLINICAL FACILITIES

Students at the George Washington University School of Medicine receive clinical training at the University Hospital, at the University Cancer Clinic, and at four affiliated hospitals. In the first year the medical student begins his work in the hospital as well as in the lecture halls and classrooms.

The George Washington University Hospital.—All clinics are under the supervision of the Dean and the chiefs of services. The individual student has direct responsibility to patients under supervision. Clinical and clinical pathological conferences are held in which the history of patients, the physical findings, laboratory records, and the post-mortem pathology, are presented and correlated.

The University Clinics.—The University Clinics have facilities for each Service in the Hospital. Fourth-year students are assigned in rotation by section for instruction in the University Clinics.

The George Washington University Cancer Clinic.—The Helen L. and Mary E. Warwick Memorial building, opened in 1954, houses the Cancer Detection Clinic and special laboratories for research related to the nature, diagnosis, and treatment of cancer.

The facilities of the Cancer Detection Clinic are used for teaching medical students. The diagnosis and treatment of various forms of neoplasms are presented. The results of treatment are evaluated by follow-up studies.

District of Columbia General Hospital.—Washington's large city hospital has 1,172 beds and an outpatient department in which approximately 145,409 patient-visits are made each year. It provides clinical opportunities in every branch of medicine and surgery.

Children's Hospital.—This is one of the largest and best known hospitals for children in the United States. Medical students receive training and clinical experience in pediatrics on both clinic and inpatient services.

St. Elizabeths Hospital.—This hospital cares for 6,425 patients a year with nearly every known psychiatric and neurologic disorder. The George Washington University medical students begin their studies in psychiatry in their first year and these studies continue throughout the four years. Prominent psychiatrists and neurologists on the St. Elizabeths staff are members of the George Washington University School of Medicine faculty. Additional clinical experience in psychiatry and neurology is gained by students at the George Washington University Hospital Psychiatric Department and in the University Clinics. Special lectures and clinical work in child psychiatry are given in the Psychiatric Department of Children's Hospital.

Mt. Alto Veterans Administration Hospital.—Clinical experience in both medical and surgical subjects is provided at this Veterans Administration hospital.

ADMISSION

APPLICATION FOR ADMISSION

1. Full directions for application will be furnished on request. The applicant should ask the registrar of each college previously attended to send an official transcript of record to the Director of Admissions, The George Washington University, 2029 G Street NW., Washington 6, D. C. Photostatic copies of credentials without the original signature of the certifying authority are not satisfactory. It is the responsibility of the applicant to see that all credentials are forwarded to the Director of Admissions of the University.

2. Two recent photographs, with signatures, are required of each applicant.

3. Applicants for admission are required to take the Medical College Admission Test, sponsored by the Association of American Medical Colleges, in advance of the academic year for which application is made.

4. A fee of \$10 to defray the cost of completing the records for consideration by the Committee on Admissions must accompany each application. This fee applies to students whose premedical training was completed at this University as well as to students who have not previously attended this University.

ENTRANCE REQUIREMENTS

College Courses

Chemistry:

Inorganic (including 4 hours of laboratory)..... 8

Qualitative analysis may be counted as part of this requirement. 6-8

Organic (including laboratory)..... 8

The equivalent of a one-year college course

Biology (including 4 hours of laboratory)..... 8

A course in either general biology or zoology

Physics (including at least 2 hours of laboratory).....	8
English Composition and Literature.....	6

With the exception of these specific requirements applicants are urged to follow their personal interests in developing their premedical courses of study. A well-balanced program, rather than a specific field, is the criterion by which an applicant is judged. It is not advisable to take courses that appear to cover subject matter in the medical program.

While well-qualified candidates are eligible for admission after completing the minimal 90 semester-hour requirement, the majority of applicants are found to be better qualified for the study of medicine after four years of college work.

ADVANCED STANDING

A student who has satisfactorily completed one or two years at any other medical school approved by the Association of American Medical Colleges and the American Medical Association, and who has the necessary preliminary educational requirements, may apply for advanced standing. Before final admission to the third year class, the applicant must have passed Part I examination of the National Board of Medical Examiners.

SELECTION PROCEDURES

The Committee on Admissions is guided in the selection of students by the applicant's academic ability, the results of the Medical College Admission Test, and personal qualifications as determined by letters of reference and personal interview. Applicants are interviewed only by invitation of the Committee.

Each applicant is notified as soon as possible after the Committee makes a decision.

An applicant who is offered a place in a class is required to notify the Director of Admissions within two weeks of his intent to accept the place reserved for him and to remit a deposit of \$100 not later than January 15th prior to the opening of classes of the academic year for which he applied. This deposit will not be refunded after January 15th. It will be credited toward the tuition for the first semester.

Accompanying the offer of a place in class will be forms for a report on physical condition. This report must be completed and returned to the Director of Admissions by the applicant's physician within two months of receipt of the letter of acceptance.

REGISTRATION

For the academic year 1960-61, registration will be conducted at the Medical School, 1335 H Street NW., from 10:00 A.M. to 4:00 P.M., September 15. Registration is for a period of one academic year.

FEES AND FINANCIAL REGULATIONS

The following fees have been adopted:

Application fee.....	\$10.00
Tuition fee, for each academic year.....	1,000.00
Fee for special examinations, for each subject.....	5.00
Residence fee, charged each student granted "leave of absence" status for the academic year in the School of Medicine.....	50.00
Graduation fee.....	25.00

PAYMENT OF FEES

Fees for the year are \$1,000, payable in two installments of \$500 each in advance of the beginning of each semester.

All fees are payable at the Office of the Cashier of the University, 725 Twenty-first Street NW., except as some other arrangement may be announced. Amounts due must be paid on or before registration day for the fall semester and on or before such date as may be announced by the Office of the Treasurer for the spring semester. (See the Calendar.)

Registration in the School of Medicine is for the full academic year. After a student has entered the courses of instruction he is obligated for the full tuition. Acceptance by the School of Medicine of a student's fees does not in any way obligate the School to accept the student for any subsequent year and the right is reserved to require the withdrawal of any student whenever, in the interest of the student or the School, the Faculty deems it advisable to do so.

Credit for work will not be given until, at the completion of a laboratory course, the student has replaced or paid for all articles of equipment or other University property which he has lost, broken, or destroyed. All breakage or loss not directly traceable to an individual student is assessed pro rata.

COST OF TEXTBOOKS AND STUDENT EQUIPMENT

The minimum cost of necessary textbooks and student equipment (microscope, drawing materials, glass slides, clinical thermometer, stethoscope, hemocytometer, uniforms, etc.) is approximately as follows: first year, \$400; second year, \$250; third year, \$125; fourth year, \$80; total \$855.

A fee of \$1 a semester is charged for the use (optional) of a locker.

FELLOWSHIPS AND GRADUATE ASSISTANTSHIPS,
SCHOLARSHIPS, PRIZES, FINANCIAL AID

FELLOWSHIPS AND GRADUATE ASSISTANTSHIPS

The following fellowships and graduate assistantships are available. Applications should be submitted not later than April 1 preceding the period for which the award is to be made.

University Teaching Fellowships.—These are assigned for the academic year to the various departments of instruction. The applicant is expected to be a prospective candidate for a Doctoral degree in the general field of his future doctoral study. Each Teaching Fellow receives an annual stipend (on a nine-month basis) of up to \$1,700 plus full tuition for whatever schedule of study or research his fellowship duties permit him to carry. Stipends vary with the work load of the individual Teaching Fellow. Normally a University Teaching Fellow renders half-time service in classroom or laboratory assignments to the department of instruction directing his doctoral study. Application should be made to the executive officer of the department of instruction concerned.

Graduate Teaching Assistantships.—These are open in various departments of instruction to candidates for the Master's degrees. Each graduate teaching assistant renders a designated unit of service to his major department if instruction, and receives, depending upon his teaching or laboratory assignments, up to \$1,700 on a nine-month basis plus tuition for the program of studies which the duties of his assistantship permit him to carry. Application should be made to the executive officer of the department of instruction concerned.

Special Fellowships.—The following Special Fellowships, supported by endowment, are available. Inquiry concerning them should be addressed to the executive officer of the department concerned.

Robin Miller Research Fellowship: A fellowship in medicine in the amount of \$3,000, established in 1953 by bequests of Mrs. Robin Miller, is offered for the study of cardiovascular diseases.

Thomas Bradford Sanders Fellowships: Fellowships varying in amount from \$900 to \$1,500 plus tuition, established in 1928 by bequest of Miss Addie Sanders in memory of her brother, Thomas Bradford Sanders, are offered in various departments of science.

SCHOLARSHIPS

Scholarships are awarded for the academic year unless otherwise specified and are credited in equal parts for each semester. Each holder must carry a full schedule of academic work during the period for which the scholarship is awarded. Applicants (except in the case of the Daughters of the American Revolution Scholarship and the Eugene and Agnes E. Meyer scholarships) must have established an academic record in courses at this institution, and should apply on prescribed forms which must be filed in the Office of the Chairman of the Committee on Scholarships not later than April 1 preceding the academic year for which the scholarship is to be awarded. Further information concerning the following scholarships may be obtained from the Chairman of the Committee on

Scholarships, The George Washington University, Washington 6, D. C.

Anna Bartsch Hospital Intern Scholarship.—This scholarship, in the amount of \$180, established in 1946 by Dr. Anna Bartsch-Dunne as a memorial to her mother, Anna Bartsch, is available to a woman intern in the George Washington University Hospital. Award is made upon the recommendation of the Hospital's Internship Committee.

Anna Bartsch Medical Student Scholarship.—This scholarship, in the amount of \$500, established in 1946 by Dr. Anna Bartsch-Dunne, as a memorial to her mother, Anna Bartsch, is available to a woman in the School of Medicine, "of outstanding scholarship, character, and promise, who intends to make the practice of medicine her life profession." The award is made upon the recommendation of the Faculty of the School of Medicine.

Everett Lamont Bradley Scholarship.—This scholarship, in the amount of \$175, established in 1954, by bequest of Alice R. H. Bradley in memory of her son, Everett Lamont Bradley, is available to a student in the School of Medicine.

Emma K. Carr Scholarship.—Four scholarships in the amount of \$400 each and ten of \$100 each, established in 1932 by Emma K. Carr, are available to "young men (of the white race) for undergraduate or postgraduate work, considering character, capacity, and need".

Maria M. Carter Scholarship.—This scholarship in the amount of \$50, established in 1871 by Maria M. Carter, is available to a young man.

Daughters of the American Revolution Scholarship.—This scholarship, in the amount of \$475, established in 1952 by the District of Columbia Daughters of the American Revolution, is available to junior and senior students, preferably women, who are descendants of patriots of the American Revolution.

Isaac Davis Scholarship.—This scholarship, in the amount of \$50, was established in 1869 by the Honorable Isaac Davis of Massachusetts. Nominations for the scholarship may be made "by the founder or his eldest lineal descendant". In case no such nomination is made, the scholarship is to be awarded by the University.

Hazelton Scholarship.—This scholarship, in the amount of \$275, established in 1950 by the bequest of Lillie S. Hazelton, is awarded annually "for the use and assistance of needy and worthy students".

Eugene and Agnes E. Meyer Scholarship.—A scholarship fund in the amount of \$3,500, established in 1952 by the Eugene and Agnes E. Meyer Foundation, is available annually "to assist promising students or applicants in meeting the costs of furthering their education, with preferential consideration to children of persons who are employed in public service, including service in the armed forces or the judiciary."

University Hospital Scholarships in Medical Technology.—Ten scholarships are available, each to cover the cost of 24 semester hours of the 30 in the last year of the curriculum leading to the degree of Bachelor of Science in Medical Technology.

The Zonta Club of Washington, D. C., Scholarship.—This scholarship, in the amount of \$300, offered by the Zonta Club of Washington, D. C., is available to a woman who is a senior or graduate student with special interest in a professional or business career.

Special Research Scholarships, supporting part-time work in the various departments, have been made available to selected medical students through grants by the Lederle Laboratories, the National Foundation for Infantile Paralysis, and the National Institutes of Health.

PRIZES

Allie S. Freed Prize.—This prize of \$40 established in 1957 by Mrs. Allie S. Freed, is awarded annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Preventive Medicine.

Alec Horwitz Prize.—This prize of \$100 established in 1959 by Dr. Alec Horwitz is awarded annually to a member of the senior class who has demonstrated exceptional proficiency in the field of Surgery.

Huron W. Lawson Prize.—This prize of \$100 established in 1957 by Mrs. Huron W. Lawson in memory of her husband, Dr. Huron W. Lawson, who was a distinguished member of the Medical Staff of The George Washington University, is awarded annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Obstetrics and Gynecology.

Julius S. Neviaser Prize in Orthopedic Surgery.—This prize of \$100, established in 1956 by Dr. Julius S. Neviaser, is awarded annually to the student of the junior class of the School of Medicine who scores the highest grade in a written examination in Orthopedics.

John Ordronaux Prize.—This prize of \$140 is awarded annually to the member of the graduating class of the School of Medicine who has the highest scholastic standing.

FINANCIAL AID

Loan Funds

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of The George Washington

University have made available a fund for short-term loans to students.

Joseph H. Himes Loan Fund.—This fund contributed by Joseph H. Himes is available for loans to students in the School of Medicine.

Kellogg Medical School Loan Fund.—The W. K. Kellogg Foundation in Battle Creek, Michigan, has established a loan fund for students in the School of Medicine.

School of Medicine Loan Fund.—This fund, contributed by medical students, is available for loans to students in the School of Medicine.

Pfizer Medical School Loan Fund.—Chas. Pfizer & Co., Inc., has established a fund for loans to students in the School of Medicine.

Henry Strong Educational Foundation.—The Henry Strong Educational Foundation, established at Chicago under the will of General Henry Strong, makes available a fund for loans to both men and women students under the age of twenty-five years.

Sutherland Medical School Loan Fund.—This fund, established by Mrs. Rose L. Sutherland, is available for loans to students in the School of Medicine.

REGULATIONS

Students in the School of Medicine are subject to, and are expected to familiarize themselves with, the general University regulations, stated in the University Catalogue.

ATTENDANCE

A student is not permitted to attend classes until registration has been completed and fees due have been paid. Regular attendance is required.

GRADES

The following grading system is used *A* (90-100); *B* (80-89); *C* (75-79); *D* (65-74) condition; *E* (below 65) failure; *Inc.*, incomplete, the passing grade in each subject is *C*.

A student conditioned in any subject will not be advanced until such condition is removed and then only by authority of the Faculty.

EXAMINATIONS

Examinations, which may be written, oral, or practical, will be held during and at the end of each semester.

All students in the School of Medicine are required to take Part I and Part II of the National Board Examinations, except that students from those states and foreign countries which do not recognize the National Board may be exempted from Part II by action of the Committee on Scholarship.

GRADUATION

Application for Graduation

Application for a degree should be filed in the Office of the Registrar at the time of registration for the senior year.

Presence at Graduation

A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the Dean.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable.

THE DEGREE OF DOCTOR OF MEDICINE

Upon the satisfactory completion of the requirements of the School of Medicine, the degree of Doctor of Medicine is conferred.

COMBINED ARTS AND MEDICINE CURRICULUM

In order to be recommended for the degree of Bachelor of Arts, the candidate must complete, at least 90 semester hours of prescribed college work (at least 30 hours and one year of residence must be completed in Columbian College, the senior liberal arts college), and the first year of the medical curriculum. Upon satisfactory completion of the fourth year of the medical curriculum the student becomes eligible for the degree of Doctor of Medicine.

REQUIREMENTS FOR THE DEGREE

Every candidate for graduation with the degree of Doctor of Medicine must be at least twenty-one years of age, and free of all indebtedness to the University. He must have completed satisfactorily not less than four academic years of study as a matriculated student in Medicine, completed all required courses, and passed satisfactorily all prescribed examinations.

HONORS

A candidate who has completed the four-year medical course with an average grade of 90 or above, may be recommended for graduation "with distinction."

INTERN AND RESIDENT TRAINING PROGRAM

The George Washington University Hospital offers rotating-type internships as classified by the National Intern Matching Program, Inc. Twenty-seven internships of one year each are offered; fourteen in the Department of Medicine with emphasis on medicine, eleven in the Department of Surgery with emphasis on surgery, and two in the Department of Pathology with emphasis on pathology.

Rotating Internships, Emphasis on Medicine.—Interns will be assigned to six months of general medicine, two months on the surgical service, and one month each on neuro-psychiatry, pediatrics, obstetrics and gynecology, and emergency.

Rotating Internships, Emphasis on Surgery.—Interns will be assigned to the surgical services for nine months, to general medicine for two months, and to obstetrics for one month.

Rotating Internships, Emphasis on Pathology.—Interns will be assigned to the pathology service for six months, to general medicine for two months, to surgery for two months, to pediatrics for one month, and to obstetrics for one month.

Fifty-five approved residencies are offered in anesthesiology, cardiac diseases, internal medicine, neurologic surgery, neurology, obstetrics-gynecology, pathology, pediatrics, physical medicine, plastic surgery, psychiatry, roentgenology, surgery and thoracic surgery. Residency programs are of from one to four years depending upon the service. Appointments are for one year subject to renewal. In several of the fields there are affiliations with local and government hospitals.

Fellowships of one or two years are available to acceptable candidates in anesthesiology, cardiology, chest diseases, infectious diseases, outpatient service, physical medicine, rheumatic diseases, surgery and thoracic surgery.

For application blanks and further information, address the Medical Director, The George Washington University Hospital, 901 Twenty-third Street NW., Washington 7, D. C.

MEDICAL TECHNOLOGY COURSE

This course is open to candidates for the degree of Bachelor of Science in Medical Technology, offered by Columbian College, and to other applicants meeting the requirements of the Registry of Medical Technologists of the American Society of Clinical Pathologists. These requirements, fully satisfied by the Columbian College program, are as follows: two years (60 semester hours or 90 quarter hours) of college work in

any college or university accredited by a recognized standardizing association, including courses in the biological sciences and in chemistry. The requirement in the biological sciences is satisfied by college courses totaling 12 semester hours (18 quarter hours) in general biology, bacteriology, parasitology, anatomy, histology, embryology, physiology, or zoology; bacteriology is especially recommended. The requirement in chemistry is met by a full year's college course in inorganic chemistry (at least 6 semester hours or 9 quarter hours) plus 3 semester hours in either quantitative analysis, organic chemistry, or biochemistry; quantitative analysis is especially recommended.

In the case of students enrolled in Columbian College for the degree of Bachelor of Science in Medical Technology, the course here described is to be considered as the final (fourth) year of qualification for the degree. In the case of those who have taken their prerequisite work in some other college or university, satisfactory completion of the Medical Technology Course will not satisfy the requirements for the degree from Columbian College.

The Medical Technology Course consists of 12 months of didactic and practical work in clinical laboratory procedures, offered by the Department of Pathology in the University Hospital. Students ordinarily begin this course with the fall semester, but under exceptional circumstances may begin at other times.

A limited number of scholarships are provided by the University Hospital for students enrolled in the fourth year of the degree program. (See page 62.) All students in this fourth year must provide themselves with uniforms; laundry of uniforms is provided by the University Hospital. A cash allowance of \$65 a month is granted during the last 6 months of the fourth year of training.

Upon satisfactory completion of the course a certificate is awarded and the candidate is eligible for the national certifying examination given by the Registry of Medical Technologists.

Enrollment in the Medical Technology Course is strictly limited so that personal instruction can be given. Acceptance to the Columbian College degree program does not necessarily assure acceptance into the Hospital program. Inquiry about this course should be sent directly to the Department of Pathology, The George Washington University Hospital, Washington 7, D. C.

STUDENT LIFE

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. It also provides first aid in the event of an emergency. Medical privileges include: (1) the physical examination of all enter-

ing students; (2) three visits by the University physician or surgeon, office or residence (District of Columbia) in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration. All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit does not apply to illness or disability incurred previous to the University semester or prior to payment of tuition fees.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student who has severed his connection with the University is ineligible for medical benefits.

PHYSICAL EXAMINATIONS

All first-year students are required to have a comprehensive physical examination within 60 days of admission to the School of Medicine. The students are informed of significant findings and advised regarding such measures as will tend to help them maintain a high standard of health.

In addition medical students benefit from the complete Tuberculosis Case Finding Program which the School maintains. Under this program all students receive tuberculin tests, X-ray examinations, and such special attention from chest specialists as is necessary to reduce to a minimum the dangers from tuberculosis. Students are immunized against those diseases for which proven prophylaxis exists.

LIVING ACCOMMODATIONS

The University maintains four residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance (for the fall semester by May first, for the spring semester by January first). Forms for application, together with detailed information, may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives, may live outside the dormitory only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Women Students.—The Hattie M. Strong Hall provides single rooms at \$42.50 a month and double rooms at \$37.50 a month a person.

The Dolly Madison Hall provides double rooms at \$37.50 a month a person.

Men Students.—Welling Hall provides double rooms for \$30 a month a person.

The John Quincy Adams Hall provides 69 double rooms each with study alcove and bath. Rooms rent for \$40 a month a person.

HONOR SOCIETIES

William Beaumont Medical Society.—Medical students showing unusual ability are elected by the active members of this society, which was founded to encourage medical writing and research among medical students.

Howard Kane-A. F. A. King Obstetrical Society.—The fifteen students in the third and fourth year classes who maintain the highest grades in their work in obstetrics are eligible for membership.

Smith-Reed-Russell Society.—Students of the third and fourth years who maintain a scholastic average of 88 per cent are eligible for membership.

Alpha Omega Alpha.—National Honor Medical Society. Members of the Junior and Senior classes meeting the qualifications specified by the constitution of the Society are eligible for election to membership.

RECREATION

The nation's capital provides abundant recreational resources, a large number of which are available at little or no cost. There are numerous art galleries, museums, concert halls, theaters, swimming pools, parks, and places of great historic interest. There are, in addition, the usual commercial recreation facilities found in a large city. Social activities

are provided by student organizations of the University, the School of Medicine, and University sponsored programs such as intramural sports, concerts, recitals, and dramatic productions. Almost every religious faith is represented in Washington by one or more churches, and much spiritual, educational, social, and recreational activity is conducted by the various church groups. There are many other cultural and educational facilities in Washington to meet almost any possible individual need or preference of a medical student and his family.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

COURSES OF INSTRUCTION

On the following pages of this BULLETIN, are listed the courses of instruction offered by the School of Medicine. The School of Medicine serves other divisions of the University by making available to non-medical students certain undergraduate and graduate courses in the following fields: Anatomy, Bacteriology, Biochemistry, Pathology, Pharmacology, Physical Medicine, and Physiology. The courses listed are subject to some slight change. The University reserves the right to withdraw any course announced.

EXPLANATION OF COURSE NUMBERS AND SYMBOLS

A number in parenthesis after the name of a course, indicates number of semester hours of credit which may be earned by nonmedical students.

First-year courses are numbered from 101 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and fourth-year courses from 401 to 500.

Courses offered in the School of Medicine for nonmedical students.—

Courses numbered from 101-200 are planned for upper-division students in undergraduate curricula. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the officer of instruction, and when the completion of additional work has been certified by the officer of instruction. Courses numbered from 201 to 500 are planned for graduate students.

ANATOMY

*Ira Rockwood Telford, Ph.D., *Professor of Anatomy, Executive Officer*
 Paul Calabrisi, Ph.D., *Professor of Anatomy*
 Robert Walmsley, M.B., Ch.B., M.D., *Visiting Research Professor of Anatomy*
 Thomas Dale Stewart, A.B., M.D., *Professorial Lecturer in Anatomy*
 Frank Duane Allan, Ph.D., *Associate Professor of Anatomy*
 Thomas Nick Johnson, Ph.D., *Associate Professor of Anatomy*
 John Bert Christensen, Ph.D., *Assistant Professor of Anatomy*
 Lloyd Eugene Church, D.D.S., Ph.D., *Clinical Instructor in Anatomy*
 Raymond Nathan Brown, M.D., *Clinical Instructor in Anatomy*
 Arnold Raymond Kaplan, Ph.D., *Teaching Fellow in Anatomy*
 James Blake Thomas, M.S., *Fellow in Anatomy*

SPECIAL LECTURERS

Webb Edward Haymaker, M.D., M.S., *Chief, Neuropathology Section, Armed Forces Institute of Pathology; Neuroanatomy*
 Joseph Vitold Michalski, Ph.D., *Anatomist, Armed Forces Institute of Pathology; Anatomy*

101-2 *Gross Anatomy*

Calabrisi and Staff

Academic year: fall—12 hours a week; spring—8½ hours a week.
 Regional dissection of the human body, supplemented with lectures and quiz sections. Study of X-ray anatomy to emphasize the functional aspects of the position, shape, and relation of the viscera and skeletal components.

103 *Human Embryology*

Allan and Staff

Fall—3 hours a week.
 The origin and development of the human body. Special emphasis on the value of embryology in interpreting anatomical anomalies and variations as seen in gross dissection, surgery, obstetrics, and pathology.

104 *Neuroanatomy*

Johnson and Staff

Spring—5½ hours a week.
 The macroscopic and microscopic study of the central nervous system and the special sense organs. Emphasis on such dynamic aspects as development, pathways, lesions, etc.

* On sabbatical leave spring semester 1959-60.

- 105 *Microscopic Anatomy* Telford and Staff
Fall—9 hours a week.
Study of the detailed minute structure of cells, tissues, and organs of the human body, with emphasis on the relation of structure to function. Recognition and interpretation of histological sections tested by practical examinations.
- 106 *Living Anatomy* The Staff
Spring—1 hour a week.
An introduction to physical diagnosis, with special emphasis on topographical anatomy.
- 201-2 *Gross Anatomy* (6-4) Calabrisi and Staff
Academic year—as arranged.
For qualified nonmedical graduate students. Same as Anatomy 101-2. Anatomy 201—laboratory fee, \$21; Anatomy 202—laboratory fee, \$16.
- 203 *Human Embryology* (2) Allan and Staff
Fall—as arranged.
For qualified nonmedical graduate students. Same as Anatomy 103. Laboratory fee, \$8.
- 204 *Neuroanatomy* (3) Johnson and Staff
Spring—as arranged.
For qualified nonmedical graduate students. Same as Anatomy 104. Laboratory fee, \$13.
- 205 *Microscopic Anatomy* (4) Telford and Staff
Fall—as arranged.
For qualified nonmedical graduate students. Same as Anatomy 105. Laboratory fee, \$13.
- 221-22 *Seminar* (1-1) Allan and Staff
Academic year: 1 hour a week—as arranged.
Research or reports and discussions of special topics by the Staff and graduate students. For graduate students. Medical students are encouraged to attend.
- 249-50 *Introduction to Medical Research** (3-3) The Staff
Academic year—Sat. 8:00 A.M. to 1:00 P.M.
Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

* This is an interdepartmental course. The student should register in the department directing his research.

295-96 *Research* (arr.)

Academic year—as arranged.

Fees to be arranged.

299-300 *Thesis* (3-3)

The Staff

The Staff

ANESTHESIOLOGY

- Charles Seymour Coakley, M.D., *Professor of Anesthesiology, Executive Officer*
 Donald Harrison Stubbs, A.M., M.D., *Clinical Professor of Anesthesiology*
 Seymour Alpert, A.B., M.D., *Associate Professor of Anesthesiology*
 Cunningham Ramsey MacCordy, M.D., *Assistant Professor of Anesthesiology*
 Solomon Naphtali Albert, A.B., M.D., *Assistant Clinical Professor of Anesthesiology*
 Paula Reines Kaiser, M.B., Ch.B., M.D., *Associate in Anesthesiology*
 William Eldridge Bageant, M.D., *Clinical Instructor in Anesthesiology*
 Allen Widome, M.D., *Clinical Instructor in Anesthesiology*
 Charles Gruenwald, A.B., M.D., *Clinical Instructor in Anesthesiology*
 Arturo Aguilar, M.D., *Fellow in Anesthesiology*
 Sang Ho Jin, M.D., *Fellow in Anesthesiology*
 Narisri Maharakhaka, M.D., *Fellow in Anesthesiology*
 Ramon Garcia, B.S., M.D., *Assistant in Anesthesiology*
 Maureen Hannah Huse, M.D., *Assistant in Anesthesiology*
 Gerda Liepina Menetrez, M.D., *Assistant in Anesthesiology*
 Richard Dennis O'Leary, B.S., D.D.S., *Assistant in Anesthesiology*
 Hugo Quintanilla, M.B., M.D., *Assistant in Anesthesiology*
 Patricia Russell, M.D., *Assistant in Anesthesiology*
 Ali Ekrem Sirman, B.C., M.D., *Assistant in Anesthesiology*
 Catherine Harman Smith, A.B., M.D., *Assistant in Anesthesiology*
 Donald Collier Smith, B.S., M.D., *Assistant in Anesthesiology*
 Felix Suanes Tantoco, D.D.M., *Assistant in Anesthesiology*
 Helene Gilliaert Werner, M.D., *Assistant in Anesthesiology*
 Hildegard Wessel, M.D., *Assistant in Anesthesiology*
 Lynn Waddoups Winchester, A.B., M.D., *Assistant in Anesthesiology*
 Eusebio Andre Zambrano, M.D., *Assistant in Anesthesiology*

320 *Anesthesiology*

The Staff

Spring—1 hour a week.

The fundamentals of anesthesia are reviewed and correlated with other medical specialties.

421-22 *Anesthesia Seminar*

The Staff

Academic year—1 hour a week.

Students attend anesthesia seminars during their surgical clinical clerkships. University Hospital.

433-34 *Advanced Anesthesiology*

Academic year—as arranged.

Students are rotated through the work of the department for a period of two weeks and assigned to work in the operating rooms and to attend conferences and seminars. For the more advanced students a three-week elective is offered.

BACTERIOLOGY, HYGIENE, AND PREVENTIVE MEDICINE

Leland Wilbur Parr, Ph.D., *Professor Emeritus of Bacteriology in Residence*

Angus MacIvor Griffin, Ph.D., *Professor of Bacteriology*
 Herbert Leonard Ley, Jr., M.D., M.P.H., *Professor of Bacteriology, Executive Officer*
 Mary Louise Robbins, Ph.D., *Professor of Bacteriology*
 Ralph Gregory Beachley, M.D., Dr.P.H., *Clinical Professor of Public Health Practice*
 William Gray McCarten, M.S., *Assistant Professor of Bacteriology*
 Rudolph Hugh, Ph.D., *Assistant Professor of Bacteriology*
 Aaron Herbert Traum, A.B., M.D., *Clinical Instructor in Preventive Medicine and Public Health*
 William Donald Hann, M.S., *Associate in Bacteriology*
 George Bernard Pelleu, Jr., M.S., *Associate in Bacteriology*

SPECIAL LECTURERS

Chester Wilson Emmons, Ph.D., *Chief, Medical Mycology Unit, Laboratory of Infectious Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health; Medical Mycology*
 Robert Carter Cook, *Director, Population Reference Bureau; Editor, Journal of Heredity; Medical Genetics*
 Robert Hanna Felix, M.D., M.P.H., *Director, National Institute of Mental Health, National Institutes of Health; Mental Hygiene*
 Francis Byron Gordon, Ph.D., M.D., *Head, Virology Division, National Naval Medical Research Institute, National Naval Medical Center; Virology*
 Samuel Jacob Ajl, Ph.D., *Assistant Chief, Department of Bacteriology, Communicable Diseases Division, Walter Reed Army Institute of Research, Walter Reed Army Medical Center; Microbiological Chemistry*
 Sarah Bishop Brooks, R.N., B.S. in P.H.N., *Director, Division of Public Health Nursing, Arlington County Health Department; Public Health Practice*
 Morris Cecil Leikind, M.S., *Chief, Historical Research Division, Medical Museum, Armed Forces Institute of Pathology; History of Microbiology*

- James Lee Goddard, M.D., M.P.H., *Chief, Accident Prevention Program, Division of Special Health Services, Department of Health, Education and Welfare; Accident Prevention*
- Leon Jacobs, Ph.D., *Chief, Laboratory of Parasitic Diseases, National Institutes of Health; Medical Parasitology*
- Harold Joseph Magnuson, A.B., M.D., M.P.H., *Chief, Occupational Health Program, Division of Special Health Services, Department of Health, Education and Welfare; Occupational Health*
- George Otis Pierce, M.S., *Assistant Chief, Bureau of Food and Public Health Engineering, D.C. Department of Health; Public Health Engineering*

Griffin

101 *Biostatistics* (1)

Fall—Sat., 11:00 A.M.

The meaning and use of statistical terms and methods pertinent to the design of experiments and the interpretation of the results obtained in laboratory, clinical, and field trials.

Hugh

112 *General Bacteriology* (4)

Spring—Mon., Wed., and Fri., 9:10 to 12:00 A.M.

For nonmedical students. A study of the fundamentals of bacteriology, including hygienic applications. Methods of cultivation and control of several groups of microorganisms are studied in the laboratory. Prerequisite: any biological laboratory science; Chemistry 11-12. Laboratory fee, \$13.

Ley and Staff

209 *Medical Microbiology* (1 to 11)

Fall: lecture (4 hours), laboratory (10 hours)—as arranged.

Bacteria, rickettsia, viruses, yeasts, molds, protozoa, and metazoa which relate to the health and diseases of man—cultural study of most important forms; methods of diagnosis by microscopic, cultural, immunologic, and animal reactions; theory and methods of immunology; vaccines; serums; antibiotics. Open to suitably prepared graduate students; may be elected as a whole or in part by adding the appropriate letter to the course number, with credit allocated as follows: (a) *Bacteriology*, including rickettsia and viruses—lecture (4), laboratory (3); (b) *Parasitology*, including medical mycology—lecture (2), laboratory (1); (c) *Immunology* (1). May be taken by a limited number of candidates for Master's degrees. Laboratory fee, \$4.50 for each semester hour of laboratory work.

Ley and Staff

210 *Fundamentals of Epidemiology and Preventive Medicine* (2)

Spring—Mon., 2:00 to 4:00 P.M.

Sources, modes, and implications of infection and injury. Consideration also given the problem of accidents and industrial medicine. Open to liberal arts graduate students. Prerequisite: Bacteriology 112 or 209.

- 219-20 *Advanced Microbiology* (arr.) Hugh and Staff
Academic year—as arranged.
Special study of advanced methods and current problems in microbiology for suitably qualified students specializing in microbiology. Prerequisite: Bacteriology 112 or 209; Chemistry 151-52 or the equivalent; permission of the instructor. Laboratory fee, \$4.50 a semester hour.
- 230 *Statistics in Microbiology* (3) Griffin
Spring—as arranged.
The application of statistical methods to the problems of microbiology. For graduate students. Prerequisite: entrance or elementary college algebra.
- 232 *Immunological Methods* (3) McCarten
1960-61 and alternate years: spring—as arranged.
Preparation and testing of serological materials. Demonstration of basic serological phenomena. For graduate students. Prerequisite: Bacteriology 112 or 209 and permission of the instructor. Laboratory fee, \$11.
- 234 *Virology* (6) Robbins
1961-62 and alternate years: spring—as arranged.
Study of viruses and rickettsiae. Lectures and laboratory exercises. For graduate students. Prerequisite: Bacteriology 112 or 209 and permission of the instructor. Laboratory fee, \$16.
- 240 *Advanced Epidemiology and Public Health* (3) Parr
Spring—as arranged.
Conferences, readings, and problems for graduate students dealing with specialized and advanced phases of the topics presented in Bacteriology 210. Prerequisite: Bacteriology 210.
- 249-50 *Introduction to Medical Research** (3-3) The Staff
Academic year—Sat., 8:00 A.M. to 1:00 P.M.
Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.
- 293-94 *Staff Seminars* (1-1) The Staff
Academic year—as arranged.
For graduate students. Bi-weekly throughout the year.

* This is an interdepartmental course. The student should register in the department directing his research.

295-96 *Research in Bacteriology* (arr.)

Academic year—as arranged.

The Staff

299-300 *Thesis* (3-3)

The Staff

401 *Public Health Practice*

Beachley and Staff

Fall—1 hour a week for 5 weeks.

Study of public health practice at national, state, city, and county levels. Public and private agencies.

BIOCHEMISTRY

Joseph Hiram Roe, Ph.D., *Professor Emeritus of Biochemistry in Residence*

Carleton Raymond Treadwell, Ph.D., *Professor of Biochemistry, Executive Officer*

William Robert Carroll, Ph.D., *Professorial Lecturer on Proteins*

George Gilbert Ashwell, M.S., M.D., *Professorial Lecturer on Enzymes*

Irving Gray, Ph.D., *Professorial Lecturer on Isotopes*

Benjamin Williams Smith, Ph.D., *Associate Professor of Biochemistry*

Leon Swell, Ph.D., *Associate Professorial Lecturer on Lipides*

George Vartkes Vahouny, Ph.D., *Assistant Professor of Biochemistry*

John Martyn Bailey, Ph.D., *Assistant Professor of Biochemistry*

Harold William Clark, Jr., Ph.D., *Associate in Biochemistry*

Ralph Richard Gray, A.B., *Fellow in Biochemistry*

Robert Marx Mayer, A.B., *Sanders Fellow in Biochemistry*

Stanley Irwin Sherr, M.S., *Sanders Fellow in Biochemistry*

113-14 *Biochemistry* The Staff

Academic year: lecture (2 hours), conference (1 hour), laboratory (6 hours)—as arranged.

Physiological and clinical chemistry. For medical students.

221-22 *Biochemistry* (4-4) Treadwell, Vahouny

Academic year—Tues. and Thurs., 9:00 to 12:00 A.M. and 1:00 to 2:00 P.M.

A lecture and laboratory course for nonmedical students. Prerequisite: Chemistry 22 and 152. Material fee, \$15 a semester.

224 *Biochemistry of the Enzymes* (1) Ashwell

Spring—Mon., 5:00 P.M.

Lecture course dealing with the biochemistry of the enzymes and enzyme reactions. Prerequisite: Biochemistry 113 or 221.

225-26 *Biochemical Procedures* (3-3) B. Smith and Staff

Academic year—as arranged.

A laboratory course. Material fee, \$16 a semester.

227-28 *Biochemistry Seminar* (1-1)

Academic year—Fri., 4:00 P.M.

The current literature in the field of biochemistry, mainly for graduate students, but open to a limited number of specially qualified medical students.

The Staff

232 *Proteins and Amino Acids* (1)

Spring—Wed., 5:00 P.M.

A lecture course. Prerequisite: Biochemistry 113 or 221.

Carroll

241 *Isotopes* (2)

Fall—Sat., 9:00 A.M.

Theoretical characterization of isotopes and their applications in biology. Attention will be given to counting, health physics and radiation safety, autoradiography and chromatography.

Gray

249-50 *Introduction to Medical Research** (3-3)

Academic year—Sat., 8:00 A.M. to 1:00 P.M.

Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7:50 a semester.

The Staff

251 *Carbohydrate Metabolism* (1)

1960-61 and alternate years: Fall—Sat., 9:00 A.M.

A lecture course. Prerequisite: Biochemistry 114 or 222.

Treadwell

261 *Biochemistry of the Lipids* (1)

1961-62 and alternate years. Fall—Sat., 9:00 A.M.

A lecture course. Prerequisite: Biochemistry 114 or 222.

The Staff

295-96 *Research in Biochemistry* (arr.)

Academic year—as arranged.

The Staff

299-300 *Thesis* (3-3)

* This is an interdepartmental course. The student should register in the department directing his research.

DERMATOLOGY AND SYPHILOLOGY

Harry Ford Anderson, M.D., *Professor of Dermatology and Syphilology,*
Executive Officer

Hayden Kirby-Smith, B.S., M.D., *Assistant Clinical Professor of Der-*
matology and Syphilology

James Quincy Gant, Jr., M.S., M.D., *Assistant Clinical Professor of*
Dermatology and Syphilology

Wendell Melvin Willett, A.B., M.D., *Associate in Dermatology and*
Syphilology

Reuben Goodman, M.D., *Associate in Dermatology and Syphilology*

Crawford Southwell Brown, A.B., M.D., *Clinical Instructor in Derma-*
tology and Syphilology

Manuel Landman, B.S., M.D., *Clinical Instructor in Dermatology and*
Syphilology

William George Ballinger, A.B., M.D., *Clinical Instructor in Derma-*
tology and Syphilology

214 *Dermatology and Syphilology*

The Staff

Spring—1 hour a week.

Lectures on diseases of the skin and syphilis.

317-18 *Clinic*

The Staff

Case demonstrations, diagnosis, and treatment of skin diseases and
syphilis. D.C. General Hospital.

407-8 *Clinic*

The Staff

Two hours a week as arranged in rotation during academic year.

Dermatology and syphilology in infants and children. Children's
Hospital.

409-10 *Clinic*

The Staff

Two hours a week as arranged in rotation during academic year.

Clinical demonstrations, diseases of the skin. University Hospital.

MEDICINE

- Thomas McPherson Brown, A.B., M.D., *Eugene Meyer Professor of Medicine, Executive Officer*
- Monroe James Romansky, A.B., M.D., *Professor of Medicine*
- Louis Katz Alpert, B.S., M.D., *Professor of Medicine*
- Charles Robert Lee Halley, A.B., M.D., *Clinical Professor of Medicine*
- Clayton Bernard Ethridge, M.D., *Clinical Professor of Medicine*
- John McCallum Evans, A.B., M.D., *Associate Professor of Medicine*
- Alvin Edward Parrish, M.D., *Associate Professor of Medicine*
- Clarence Richard Hartman, A.B., M.D., *Associate Professor of Medicine*
- Pearl Holly, M.S., M.D., *Associate Clinical Professor of Medicine*
- James Joseph Feffer, A.B., M.D., *Associate Clinical Professor of Medicine*
- Andrew Gabriel Prandoni, B.S., M.D., *Associate Clinical Professor of Medicine*
- Halla Brown, M.D., *Associate Clinical Professor of Medicine*
- Stewart William Bush, B.S., M.D., *Assistant Professor of Medicine*
- William Robert Felts, Jr., B.S., M.D., *Assistant Professor of Medicine*
- George Archibald Kelser, Jr., B.S., M.D., *Assistant Professor of Medicine*
- John Alton Reed, A.B., M.D., *Assistant Clinical Professor of Medicine*
- Theodore Judson Abernethy, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Roy Hertz, Ph.D., M.D., *Assistant Clinical Professor of Medicine*
- Benjamin Manchester, M.D., *Assistant Clinical Professor of Medicine*
- Ludwig George Lederer, M.D., Ph.D., *Assistant Clinical Professor of Medicine*
- John Eldrid Smith, A.B., M.D., *Assistant Clinical Professor of Medicine*
- John Watkins Trenis, A.B., M.D., *Assistant Clinical Professor of Medicine*
- Lawrence Elias Putnam, A.B., M.D., *Assistant Clinical Professor of Medicine*
- Roy Ernest Albert, A.B., M.D., *Assistant Clinical Professor of Medicine*
- Elizabeth Harman Hill, M.D., *Assistant Clinical Professor of Medicine*
- Joseph Edward Rall, M.D., Ph.D., *Assistant Clinical Professor of Medicine*
- Benjamin Hardy Sullivan, Jr., A.B., M.D., *Assistant Clinical Professor of Medicine*
- John Atkinson Owen, Jr., B.S., M.D., *Assistant Clinical Professor of Medicine*

- Lawrence Jay Thomas, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Myer Harold Stolar, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Alfred Brigulio, M.D., *Assistant Clinical Professor of Medicine*
- Thomas Stone Sappington, A.B., M.D., *Assistant Clinical Professor of Medicine*
- Samuel Jacob Nathan Sugar, Phar.G., M.D., *Assistant Clinical Professor of Medicine*
- Joseph Ney, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Joseph Beinstein, A.B., M.D., *Assistant Clinical Professor of Medicine*
- Frank Solomon Bacon, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Henry Dunlop Ecker, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Jack Jacob Rheingold, A.B., M.D., *Assistant Clinical Professor of Medicine*
- Irene Gorski Tamagna, M.D., *Assistant Clinical Professor of Medicine*
- John Wilmer Latimer, Jr., M.D., *Assistant Clinical Professor of Medicine*
- Charles Wilson Jones, A.B., M.D., *Assistant Clinical Professor of Medicine*
- Charles Waters Thompson, M.D., *Assistant Clinical Professor of Medicine*
- Eugene Solomen Gladsden, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Maurice Mensh, M.D., *Assistant Clinical Professor of Medicine*
- Arthur Rosenbaum, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Francis James Murray, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Edwin Pearson Parker III, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Morris Hirsh Rosenberg, A.B., M.D., *Assistant Clinical Professor of Medicine*
- John William DuChez, M.D., *Assistant Clinical Professor of Medicine*
- William Otis Bailey, Jr., M.D., *Assistant Clinical Professor of Medicine*
- Milton Gusack, A.B., M.D., *Assistant Clinical Professor of Medicine*
- Jack Kleh, A.B., M.D., *Assistant Clinical Professor of Medicine*
- Thomas Alphonse Gonder, B.S., M.D., *Assistant Clinical Professor of Medicine*
- Maurice Protas, A.B., M.D., *Associate in Medicine*
- Charles William Ordman, A.B., M.D., *Associate in Medicine*
- Richard Bernard Castell, A.B., M.D., *Associate in Medicine*
- Sam Thompson Gibson, B.S., M.D., *Associate in Medicine*

- Ralph Bretney Miller, A.B., M.D., *Associate in Medicine*
 Ernest Cotlove, B.S., M.D., *Associate in Medicine*
 Thomas James Kennedy, Jr., B.S., M.D., *Associate in Medicine*
 Jack Orloff, M.D., *Associate in Medicine*
 John Bayne Marbury, M.D., *Associate in Medicine*
 Louis Ross, M.D., *Associate in Medicine*
 Frederic Dunbar Chapman, A.B., M.D., C.M., *Associate in Medicine*
 Luther Henry Snyder, A.B., M.D., *Associate in Medicine*
 Robert George Taylor, M.D., *Associate in Medicine*
 James Walling Long, M.D., *Associate in Medicine*
 Irvin Kerlan, B.S., M.D., C.P.H., *Associate in Medicine*
 Virginia Patterson Beelar, A.B., M.D., *Associate in Medicine*
 Lester Sylvan Blumenthal, A.B., M.D., M.S. in Med., *Associate in Medicine*
 Stanley William Kirstein, A.B., M.D., *Associate in Medicine*
 James Francis Ambury, B.S., M.D., *Associate in Medicine*
 Robert Norwood Coale, B.S., M.D., *Associate in Medicine*
 Israel Kessler, M.S., M.D., *Associate in Medicine*
 Warren Daniel Brill, B.S., M.D., *Associate in Medicine*
 Marvin Fuchs, B.S., M.D., *Associate in Medicine*
 William Jack Weaver, Jr., A.B., M.D., *Associate in Medicine*
 Ruth Boshwitz Benedict, A.B., M.D., *Associate in Medicine*
 Harold Martin Silver, A.B., M.D., *Associate in Medicine*
 James Theodore Burns, M.D., *Associate in Medicine*
 Thomas Lees Hartman, A.M., M.D., *Associate in Medicine*
 Boris Rabkin, A.B., M.D., *Associate in Medicine*
 Morton Harold Rose, M.D., *Associate in Medicine*
 Cyril Augustus Schulman, B.S., M.D., *Associate in Medicine*
 Louis Aleck Craig, Jr., A.B., M.D., *Associate in Medicine*
 Abraham Wolffe Danish, A.B., M.D., *Associate in Medicine*
 Adolph Friedman, A.B., M.D., *Associate in Medicine*
 Alvin Randolph Sweeney, Jr., A.B., M.D., *Associate in Medicine*
 *Albert Sjoerdsma, Ph.D., M.D., *Associate in Medicine*
 Alvin Seltzer, B.S., M.D., *Associate in Medicine*
 Samuel Dennis Loube, A.B., M.D., *Associate in Medicine*
 Alfred Baer, A.B., M.D., *Associate in Medicine*
 Herbert Abramson, A.M., M.D., *Associate in Medicine*
 Henry Krause Beye, A.B., M.P.H., M.D., *Associate in Medicine*
 James Hutcheon Pert, A.B., M.D., *Associate in Medicine*
 John Walsh, B.S., M.D., *Associate in Medicine*
 Charles Edward Law, M.D., *Associate in Medicine*
 Edward Luke Rea, A.B., M.D., *Associate in Medicine*
 James Packard Mann, M.D., *Associate in Medicine*

* On leave of absence 1959-60

- Conrad Gossels, M.D., *Associate in Medicine*
James Eliot Chapman, M.D., *Associate in Medicine*
Marshall Hannis Jacobson, A.B., M.D., *Associate in Medicine*
Gottfried Karl Duschak, M.D., *Associate in Medicine*
Howard Otis Mott, A.B., M.D., *Associate in Medicine*
Irene I-Lien Hsu Siu, B.S., M.D., *Associate in Medicine*
Bertle Nelson, A.B., M.D., *Associate in Medicine*
William Kirkman Billingsley, Jr., A.B., M.D., *Associate in Medicine*
Howard Erwin Ticktin, A.B., M.D., *Associate in Medicine*
William John Schewe, A.B., M.D., *Associate in Medicine*
Richard Crosman Fowler, B.S., M.D., *Instructor in Medicine*
Emil Herbert Bauersfeld, A.B., M.D., *Clinical Instructor in Medicine*
Harry Clark Bates, B.S., M.D., *Clinical Instructor in Medicine*
Jeanne Cecile Bateman, A.B., M.D., *Clinical Instructor in Medicine*
George Sharpe, A.B., M.D., *Clinical Instructor in Medicine*
William Lewis, M.D., *Clinical Instructor in Medicine*
Maurice Arthur Sisen, A.B., M.D., *Clinical Instructor in Medicine*
William Holmes Crosby, A.B., M.D., *Clinical Instructor in Medicine*
Joseph Hicks Watson, B.S., M.D., *Clinical Instructor in Medicine*
Charles Joseph Savarese, Jr., A.B., M.D., *Clinical Instructor in Medicine*
Bernard Robert Cooperman, A.B., M.D., *Clinical Instructor in Medicine*
Norman Hartley Rubenstein, M.D., *Clinical Instructor in Medicine*
Max Gimble Sherer, M.S., M.D., *Clinical Instructor in Medicine*
Donald Morgan Watkin, A.B., M.D., *Clinical Instructor in Medicine*
Edward Adelson, B.S., M.D., *Clinical Instructor in Medicine*
Gerald John Fisher, A.B., M.D., *Clinical Instructor in Medicine*
William Leete Stone, A.B., M.D., *Clinical Instructor in Medicine*
Jacob Robbins, A.B., M.D., *Clinical Instructor in Medicine*
Bernard Howard Ostrow, A.B., M.D., *Clinical Instructor in Medicine*
James Charles Mandes, A.B., M.D., *Clinical Instructor in Medicine*
Charles David Cooper, A.B., M.D., *Clinical Instructor in Medicine*
Robert Reid Belton, A.B., M.D., *Clinical Instructor in Medicine*
Robert Lynwood Howard, A.B., M.D., *Clinical Instructor in Medicine*
Walter Kurland, B.S., M.D., *Clinical Instructor in Medicine*
Edward Joseph Leonard, M.D., *Clinical Instructor in Medicine*
Paul Wesley Yost, B.S., M.D., *Clinical Instructor in Medicine*
Robert Sirkosky Gordon, Jr., A.B., M.D., *Clinical Instructor in Medicine*
Donald Sharp Frederickson, B.S., M.D., *Clinical Instructor in Medicine*
Sam Chapman Pascoe, A.B., M.D., *Clinical Instructor in Medicine*
Wilfred Russell Ehrmantraut, B.S., M.D., *Clinical Instructor in Medicine*
Jack Crowell, B.S., M.D., *Clinical Instructor in Medicine*
David Stanley Davis, A.B., M.D., *Clinical Instructor in Medicine*

- Herschel Elroy Richardson, A.B., M.D., *Clinical Instructor in Medicine*
 John Whitson Roark, B.S., M.D., *Clinical Instructor in Medicine*
 Jerome Harold Epstein, A.M., M.D., *Clinical Instructor in Medicine*
 George Cumming Buchanan, A.B., M.D., *Clinical Instructor in Medicine*
 Montague Lane, M.D., M.S., *Clinical Instructor in Medicine*
 Forest Klaire Harris II, B.S., M.D., *Clinical Instructor in Medicine*
 Audry Connor, A.B., M.D., *Clinical Instructor in Medicine*
 Harold Irwin Passes, M.D., B.Surg., *Clinical Instructor in Medicine*
 Charles William Foulke, A.B., M.D., *Clinical Instructor in Medicine*
 Margaret Katherine McCabe, M.D., *Clinical Instructor in Medicine*
 Harold Heacock Orvis, B.S., M.D., *Clinical Instructor in Medicine*
 Arnold Albert Lear, M.D., *Clinical Instructor in Medicine*
 Orville Wright Donnelly, M.S., M.D., *Clinical Instructor in Medicine*
 Robert Francis Dyer, A.B., M.D., *Clinical Instructor in Medicine*
 Edward Harold Levine, A.B., M.D., *Clinical Instructor in Medicine*
 Robert Smallwood Poole, A.B., M.D., *Clinical Instructor in Medicine*
 Pindaros Roy Vagelos, A.B., M.D., *Clinical Instructor in Medicine*
 Arthur Donald Merritt, A.B., M.D., *Clinical Instructor in Medicine*
 Irwin Ardham, A.B., M.D., *Fellow in Medicine (Cardiovascular Diseases)*
 Stanley Bialek, B.S., M.D., *Fellow in Medicine (Cardiovascular Diseases)*
 Cesar Augusto Caceres, B.S., M.D., *Research Fellow in Medicine (Cardiovascular Diseases)*
 Juan Bautista Calatyud, M.D., *Fellow in Medicine (Cardiovascular Diseases)*
 Victor Coronho, M.D., *Fellow in Medicine*
 Stephen William Dejter, A.B., M.D., *Robin Miller Fellow in Medicine (Cardiovascular Diseases)*
 George Themistocles Economos, M.D., *Fellow in Medicine (Arthritis and Metabolic Diseases)*
 Fred Erdman Hatch, Jr., M.D., *Fellow in Medicine (Renal Diseases)*
 Susan Kessler, A.B., M.D., *Fellow in Medicine*
 Norman Clifford Kramer, M.S., M.D., *Fellow in Medicine (Renal Diseases)*
 Manfred Steiner, M.D., *Fellow in Medicine (Hematology)*
 Mary Falorsi Watt, M.D., *Research Fellow in Medicine (Renal Diseases)*
 Thomas Anderson Duncan, A.B., M.D., *Assistant in Medicine*
 Wilfred Gallinek, A.B., M.D., *Assistant in Medicine*
 Joseph Anthony Ionno, A.B., M.D., *Assistant in Medicine*
 Joseph Wayland Linhart, B.S., M.D., *Assistant in Medicine*
 William Fitzgerald Morrissey, A.B., M.D., *Assistant in Medicine*
 Francis Shingler Pooser, A.B., M.D., *Assistant in Medicine*

John Howard Renner, A.B., M.D., *Assistant in Medicine*
 Paul Schlein, A.B., M.D., *Assistant in Medicine*
 Richard Schoenfeld, B.S., M.D., *Assistant in Medicine*

SPECIAL LECTURERS

Albert David Kistin, A.M., M.D., *Chief of Medicine, Beckley Memorial Hospital, Beckley, West Virginia; Cardiology*
 Walter Kendall Myers, B.S., M.D., *Senior Attending Physician, Washington Hospital Center; Consultant in Internal Medicine, Glenn Dale Hospital and Washington Home for Incurables; Internal Medicine*
 Sol Katz, B.S., M.D., *Chief of Medicine, Mt. Alto Hospital; Pulmonary Diseases*
 Robert William Berliner, B.S., M.D., *Chief, Section on Kidney and Electrolyte Metabolism, National Heart Institute, National Institutes of Health; Renal Diseases*
 Henry Field, Jr., B.S., M.D., *Chief, Medical Service, Veterans Administration Center, Martinsburg, W. Va.; Internal Medicine*
 Thomas Hodge McGavack, A.B., M.D., *Chief of Intermediate Service, Veterans Administration Center, Martinsburg, W. Va., Metabolic Diseases*
 Peter Diacoumis Comanduras, B.S., M.D., M.S. in Med., *Secretary General, Medical International Cooperation; Gastroenterology*
 Walter Lewis Nalls, M.D., *Consultant, Veterans Administration Center, Martinsburg, W. Va.; Pulmonary Diseases*

106 *Living Anatomy*

The Staff

Spring—1 hour a week.

An introduction to physical diagnosis, with special emphasis on topographical anatomy.

236 *Clinical Microscopy*

The Staff

Spring—3 hours a week.

Conferences and studies in the clinical application of laboratory examinations of blood, body fluids, exudates, excreta.

242 *Physical Diagnosis*

The Staff

Spring—6 hours a week.

Covers not only theoretical but practical application of principles of physical diagnosis as related to examination of patients.

- 243-44 *Introduction to Medicine* The Staff
Academic year—2 hours a week.
Lectures covering the principles of internal medicine preparatory to clinical studies and training in the inpatient and outpatient services.
- 325-26 *Clinical Clerkship* The Staff
Eight weeks as arranged during academic year.
Training with bed patients under individual instruction designed to develop ability in examination of patients and case taking as well as practice in clinical microscopy. D. C. General Hospital.
- 327 *Clinical Pathological Conferences I* The Staff
Fall—1 hour a week.
Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are compared.
- 339-40 *Therapeutic Conferences I* Staff of Medicine and Pharmacology
Academic year—1 hour a week.
Conferences designed to emphasize the application of pharmacological principles to the problems of clinical medicine. University Hospital.
- 349-50 *Medical Conferences* The Staff
Academic year—2 hours a week.
D. C. General Hospital.
- 421-22 *Outpatient Clinics* The Staff
Six weeks as arranged during academic year.
Individual case studies under personal supervision of the Staff. Daily clinics on current medical problems and seminars stressing physiological aspects of diseases. Individual examinations and instruction in medical specialties. University Hospital.
- 423-24 *Clinical Clerkship* The Staff
Six weeks as arranged during academic year.
University, Mt. Alto, and D. C. General hospitals.
- 427-28 *Clinical Pathological Conferences II* The Staff
Academic year—1 hour a week.
Continuation of Medicine 327.
- 429-30 *Clinical Pathological Conferences III* The Staff
Academic year—1 hour a week.
Conferences are held at the University Hospital. Attendance is required of students during their medical clerkships there.

NEUROLOGY AND NEUROLOGICAL SURGERY

- James Winston Watts, B.S., M.D., *Professor of Neurological Surgery, Executive Officer*
 Harold Stevens, Ph.D., M.D., *Professor of Neurology*
 Seymour Solomon Kety, A.B., M.D., *Professorial Lecturer in Neurology*
 Hyman David Shapiro, M.D., *Associate Clinical Professor of Neurology*
 Robert Henry Groh, B.S., M.D., *Associate Clinical Professor of Neurology*
 Jonathan Marshall Williams, M.D., *Associate Clinical Professor of Neurological Surgery*
 James Peter Murphy, B.S., M.D., *Assistant Clinical Professor of Neurological Surgery*
 Hugo Victor Rizzoli, A.B., M.D., *Assistant Clinical Professor of Neurological Surgery*
 Anatole Stephen Dekaban, M.D., Ph.D., *Assistant Clinical Professor of Neurology*
 Paul Chodoff, A.B., M.D., *Assistant Clinical Professor of Neurology*
 George Davis Weickhardt, M.D., *Associate in Neurology*
 Harvey Ammerman, B.S., M.D., *Associate in Neurological Surgery*
 George Joseph Hayes, B.S., M.D., *Associate in Neurological Surgery*
 Cosimo Ajmone Marsan, M.D., *Associate in Neurology*
 Marvin Curtis Korengold, D.D.S., B.S., M.D., *Clinical Instructor in Neurology*
 John Thomas Lord, A.B., M.D., C.M., *Clinical Instructor in Neurological Surgery*
 Delora Fowler Mott, M.D., *Clinical Instructor in Neurology*
 Norman Harold Horwitz, A.B., M.D., *Clinical Instructor in Neurological Surgery*
 Zack Witten Sanders, A.B., M.D., *Clinical Instructor in Neurology*
 Ninos Myrianthopoulos, Ph.D., *Clinical Instructor in Neurology*
 Robert Hood Robertson, M.D., *Clinical Instructor in Neurology*
 Robert Allen Mendelsohn, M.D., *Clinical Instructor in Neurological Surgery*
 Emanuele Mannarino, M.D., *Fellow in Neuropathology*
 Karin Becker Nelson, M.D., *Fellow in Neurology*
 John William Barrett, M.D., *Assistant in Neurosurgery*

249 *Neurology: Basic*

Stevens, Williams

Fall—1 hour a week.

Methods used to study the form and function of the nervous system.
 Lectures and laboratory demonstrations.

- 250 *Neurology* Stevens, Shapiro
 Spring—1 hour a week.
 Introductory lectures on clinical neurology with specimens, lantern slides, and motion pictures.
- 331 *Neurology and Neurological Surgery* Watts, Stevens
 Fall—1 hour a week.
 Clinical lectures and demonstrations.
- 333-34 *Neurology and Neurological Surgery, Clinical Clerkship* Stevens, Williams, Ammerman
 In conjunction with Neurology 335-36. Two weeks in rotation as arranged during academic year.
 Instruction in history, physical examination, ordinary clinical procedures. Attendance at neurosurgical operations. Six students in rotation. D. C. General Hospital.
- 335-36 *Neurosurgical Conferences* Watts and Staff
 Clinical conferences weekly. Six students in rotation. D. C. General Hospital.
- 431-32 *Neurology and Neurological Surgery Clinic* Shapiro, Rizzoli
 Two hours a week for three weeks in rotation as arranged during academic year.
 Neurological outpatient clinic. Consultation of staff on ambulatory cases, demonstration of diagnostic procedures. Six students in rotation. University Hospital.
- 433-34 *Clinical Neurology* Groh, Sanders
 Two hours a week for three weeks in rotation as arranged during academic year.
 Neurological inpatient examinations and demonstrations. Six students in rotation. St. Elizabeths Hospital.
- 435-36 *Neurological Surgery (elective)* The Staff
 Academic year—bimonthly.
 Lectures and motion picture demonstration of neurosurgical problems.

OBSTETRICS AND GYNECOLOGY

- John Parks, M.S., M.D., *Professor of Obstetrics and Gynecology*
 Robert Henry Barter, B.S., M.D., *Professor of Obstetrics and Gynecology, Executive Officer*
 Henry Luran Darner, A.B., M.D., *Clinical Professor of Obstetrics and Gynecology*
 George Nordlinger, A.B., M.D., *Clinical Professor of Obstetrics and Gynecology*
 Samuel Mayer Dodek, A.M., M.D., *Associate Clinical Professor of Obstetrics and Gynecology*
 James Glover Sites, M.D., *Assistant Professor of Obstetrics and Gynecology*
 William Prentiss McKelway, A.B., M.D., *Assistant Professor of Obstetrics and Gynecology*
 Jeremiah Keith Cromer, M.D., *Assistant Clinical Professor of Obstetrics and Gynecology*
 James Albert Dusbabek, M.D., *Assistant Clinical Professor of Obstetrics and Gynecology*
 Clarence Kendall Fraser, Ph.B., M.D., *Assistant Clinical Professor of Obstetrics and Gynecology*
 Caroline Jackson, A.M., M.D., *Assistant Clinical Professor of Obstetrics and Gynecology*
 Barton Winters Richwine, M.D., *Associate in Obstetrics and Gynecology*
 Floyd Sterling Rogers, B.S., M.D., *Associate in Obstetrics and Gynecology*
 Rufus Martin Roll, A.B., M.D., *Associate in Obstetrics and Gynecology*
 William Thurston Lady, M.D., *Associate in Obstetrics and Gynecology*
 Jed Williams Pearson, Jr., A.B., M.D., *Associate in Obstetrics and Gynecology*
 Thomas Miles Leonard, Ph.B., M.D., *Associate in Obstetrics and Gynecology*
 Shirley Sue Martin, A.B., M.D., *Associate in Obstetrics and Gynecology*
 Neel Jack Price, B.S., M.D., *Associate in Obstetrics and Gynecology*
 Thomas Ashton Wilson, A.B., M.D., *Associate in Obstetrics and Gynecology*
 Julius Robert Epstein, M.D., *Clinical Instructor in Obstetrics and Gynecology*
 Morton Selwyn Kaufman, A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*
 Samuel Hazen Shea, A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*

OPHTHALMOLOGY

- Ronald Atmore Cox, A.B., M.D., *Professor of Ophthalmology, Executive Officer*
- Ernest Alfred Watson Sheppard, M.D., C.M., *Clinical Professor of Ophthalmology*
- Richard Wallace Wilkinson, A.B., M.D., M.S. in Med., *Assistant Clinical Professor of Ophthalmology*
- Walter Joseph Romejko, B.S., M.D., *Associate in Ophthalmology*
- William Paxson Chalfant, Jr., M.D., *Associate in Ophthalmology*
- William Joseph Graham Davis, A.B., M.D., *Associate in Ophthalmology*
- Robert Edward duPrey, B.S., M.D., *Associate in Ophthalmology*
- Robert Day, A.B., M.D., *Associate in Ophthalmology*
- Melvin Gustavus Alper, A.B., M.D., *Associate in Ophthalmology*
- John Henry Gilligan, M.D., *Clinical Instructor in Ophthalmology*
- John Hayes Lodge, A.B., M.D., *Clinical Instructor in Ophthalmology*
- William Bainbridge Glew, M.D., M.S., *Clinical Instructor in Ophthalmology*
- John Russell Weimer, B.S., M.D., *Clinical Instructor in Ophthalmology*

352 *Ophthalmology*

Spring—one hour a week for sixteen weeks as arranged.

Lecture course presenting aspects of all the principles of ophthalmology.

The Staff

447-48 *Clinic*

Academic year—as arranged.

Each student is given individual instruction in ophthalmological diagnosis.

The Staff

OTOLARYNGOLOGY

James Jerry McFarland, Jr., B.S., M.D., *Associate Clinical Professor of Otolaryngology, Executive Officer*

Catherine Birch, A.B., M.D., *Assistant Clinical Professor of Otolaryngology*

Jack Louis Levine, M.D., *Assistant Clinical Professor of Otolaryngology*

Morris Edward Krucoff, B.S., M.D., *Associate in Otolaryngology*

Willard Beecher Walters, B.S., M.D., *Associate in Otolaryngology*

Russel Smith Page, Jr., A.B., M.D., *Associate in Otolaryngology*

Joseph Aziz Sabri, A.B., M.D., *Associate in Otolaryngology*

William MacLohon Tribble, A.B., M.D., *Associate in Otolaryngology*

351 *Otolaryngology*

The Staff

Spring—1 hour a week for fourteen weeks.

Lectures and demonstrations on anatomy, physiology, and diseases of the ear, nose, and throat.

354 *Bronchoscopy*

The Staff

Spring—1 hour a week for two weeks.

A series of lectures on the fundamental principles and the use of instruments, including both the bronchoscope and esophagoscope.

355-56 *Clinic*

The Staff

One and one-half hours a week in rotation as arranged during academic year.

Practical clinical instruction in the diagnosis and treatment of diseases of the ear, nose, and throat. D. C. General Hospital.

PATHOLOGY

Thomas Martin Peery, A.B., M.D., *Professor of Pathology, Executive Officer*
 Daniel Leigh Weiss, A.B., M.D., *Clinical Professor of Pathology*
 Frank Nelson Miller, Jr., B.S., M.D., *Associate Professor of Pathology*
 William Newman, A.B., M.D., *Associate Professor of Pathology*
 William Laverne Marsh, B.S., M.D., *Assistant Professor of Pathology*
 Lois Irene Platt, A.B., M.D., *Associate in Pathology*
 Peter Clemente, M.D., *Assistant in Pathology*
 Luis Zuasola Magtibay, M.D., *Assistant in Pathology*
 Cesar Miranda, M.D., *Assistant in Pathology*
 Joseph Hiram Roe, Jr., A.M., M.D., *Assistant in Pathology*
 Uthman Abd-Salam Shibaro, A.B., M.D., *Assistant in Pathology*

SPECIAL STAFF FOR DEMONSTRATIONS

John Stewart Howe, A.B., M.D., *Associate Clinical Professor of Pathology*
 Erving Francis Geever, M.D., Ph.D., *Assistant Clinical Professor of Pathology*
 Raymond Georges Gottschalk, B.S., M.D., *Assistant Clinical Professor of Pathology*
 Richard Emery Palmer, A.B., M.D., *Assistant Clinical Professor of Pathology*
 Lorenz Eugene Zimmerman, A.B., M.D., *Associate in Pathology*
 William Francis Enos, A.B., M.D., *Associate in Pathology*
 Lester Walter Fix, M.D., *Associate in Pathology*
 Charles Barrie Cook, B.S., M.D., *Clinical Instructor in Pathology*
 Charles Phelps Barnett, M.D., *Clinical Instructor in Pathology*

SPECIAL LECTURERS

Elson Bowman Helwig, B.S., M.D., *Chief, Pathology Division, Armed Forces Institute of Pathology*
 Lent Clifton Johnson, B.S., M.D., *Pathologist, Armed Forces Institute of Pathology*

115-16 *Introduction to Medical Science* (1-1)

Marsh and Staff

Academic year—1 hour a week.

For students in medical technology at the University Hospital. These lectures, based upon physiology, pathology, and medicine, provide a background for the interpretation of laboratory data.

117-18 *Principles in Medical Technology* (4-4) Marsh and Staff

Academic year—4 hours a week.

For students in medical technology at the University Hospital. Theories, principles, and sources of error, of the methods used in clinical chemistry, clinical bacteriology, serology, hematology, and clinical microscopy.

119 *Medical Technology Laboratory* (20) Marsh and Staff

30 hours a week for 50 weeks.

Practice and experience by rotation through the various divisions of the Pathology laboratories of the University Hospital, as follows: hematology and urinalysis, 12 weeks; chemistry, 12 weeks; bacteriology and parasitology, 10 weeks; blood bank, 8 weeks; serology, 4 weeks; tissue pathology, 4 weeks.

259-60 *Pathology*

Peery, Miller

Fall—9 hours a week; spring—3 hours a week.

General pathology of inflammations, degenerations, malformations, and neoplasms. Special pathology of the organs and specific diseases. The laboratory work consists of the gross and microscopic study of diseased tissue. Special emphasis is placed on the interrelationships of the various pathologic changes and their correlation with symptoms and physical signs.

261-62 *Necropsy*

The Staff

Academic year—as arranged.

Students are required to attend and assist in the performance of necropsies at the University Hospital.

263-64 *Demonstrations in Pathology*

Special Staff

Academic year—1 hour a week.

Gross specimens from several hospitals are demonstrated and discussed.

267-68 *Seminars in Pathology*

Special Lecturers

Academic year—as arranged.

Advanced lectures are presented as arranged on special topics in pathology.

270 *Forensic Pathology and Medical Jurisprudence*

Miller

Spring—1 hour a week.

Forensic pathology, toxicology, chemistry, and immunology. The legal and ethical rights and responsibilities of physicians. Legal problems in medicine.

323-24 *Surgical Pathology I*

Academic year—1 hour a week.

Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing current surgical specimens.

Weiss

The Staff

327 *Clinical Pathological Conferences I*

Fall—1 hour a week.

Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are correlated.

The Staff

427-28 *Clinical Pathological Conferences II*

Academic year—1 hour a week.

Continuation of Pathology 327.

The Staff

429-30 *Clinical Pathological Conferences III*

Academic year—1 hour a week.

Conferences are held at the University Hospital. Attendance is required of students during the medical clerkship there.

Attendance is

Newman

492 *Surgical Pathology II*

Spring—1 hour a week.

A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically.

The Staff

493-94 *Pathology Clerkship (elective)*

Academic year—as arranged.

A limited number of students receive training in surgical pathology and necropsies in the laboratories of the University Hospital.

PEDIATRICS

- Margaret Mary Nicholson, A.B., M.D., *Clinical Professor of Pediatrics*
 Edward Lewis, M.D., *Clinical Professor of Pediatrics*
 William Staton Anderson, A.B., M.D., *Clinical Professor of Pediatrics*
 Robert Harold Parrott, M.D., *Clinical Professor of Pediatrics*
 Leroy Edward Hoeck, M.D., *Clinical Professor of Pediatrics*
 John Augustine Washington, B.S., M.D., *Associate Clinical Professor of Pediatrics*
 Reginald Spencer Lourie, B.S., M.D., Med.Sc.D., *Associate Clinical Professor of Pediatric Psychiatry*
 Thomas Elmer Reichelderfer, B.S., M.D., M.P.H., *Associate Clinical Professor of Pediatrics*
 William Allen Howard, A.B., M.D., *Associate Clinical Professor of Pediatrics, Executive Officer*
 Margaret Frances Gutelius, A.B., M.D., *Assistant Clinical Professor of Pediatrics*
 Mabel Harlakenden Grosvenor, M.D., *Assistant Clinical Professor of Pediatrics*
 Aaron Nimetz, A.B., M.D., *Assistant Clinical Professor of Pediatrics*
 George Maksim, M.D., M.S. in Ped., *Assistant Clinical Professor of Pediatrics*
 John Howell Peacock, Jr., B.S., M.D., *Associate in Pediatrics*
 Maynard Irving Cohen, A.B., M.D., *Associate in Pediatrics*
 Mary Katherine Laurence Sartwell, A.B., M.D., *Associate in Pediatrics*
 Allan Bertram Coleman, M.D., *Associate in Pediatrics*
 Charles Frederick Stiegler, A.B., M.D., *Associate in Pediatrics*
 Hugh Gambel Clark, A.B., M.D., *Associate in Pediatrics*
 Robert Recinos, Jr., B.S., M.D., *Associate in Pediatrics*
 Robert Edward Martin, M.D., *Associate in Pediatrics*
 Charles Richard Webb, B.S., M.D., *Associate in Pediatrics*
 William Stark, A.B., M.D., *Associate in Pediatric Psychiatry*
 Archibald Rich MacPherson, A.B., M.D., *Associate in Pediatrics*
 Frances Wha Shik Min, M.D., *Instructor in Pediatrics*
 Herbert Harold Diamond, M.D., *Clinical Instructor in Pediatrics*
 Reginald Henry Mitchell, M.D., *Clinical Instructor in Pediatrics*
 Robert Orr Warthen, M.D., *Clinical Instructor in Pediatrics*
 Emilie Annabelle Black, B.S., M.D., *Clinical Instructor in Pediatrics*
 Robert Harper Anderson, M.D., *Clinical Instructor in Pediatrics*
 Warren Godfrey Preisser, A.B., M.D., *Clinical Instructor in Pediatrics*
 Sanford Leon Leikin, M.D., *Clinical Instructor in Pediatric Psychiatry*
 Bennett Olshaker, A.B., M.D., *Clinical Instructor in Pediatric Psychiatry*

Harold Taylor Yates, M.D., *Clinical Instructor in Pediatrics*
 Roger Bergstrom, M.D., *Clinical Instructor of Pediatrics*
 George Joel Cohen, M.D., *Clinical Instructor in Pediatrics*
 Milton Sanford Glatt, A.B., M.D., *Clinical Instructor in Pediatrics*
 Marvin Irwin Mones, M.D., B.S., *Clinical Instructor in Pediatrics*
 Mary Alice Vann Fox, A.B., M.D., *Clinical Instructor in Pediatrics*
 James Larrabee Hatleberg, A.B., M.D., *Clinical Instructor in Pediatrics*

Psychiatry

Seymour Zonald Goldblatt, B.S., M.D., *Clinical Instructor in Pediatrics*
 Hilary Clara Millar, L.R.C.P. and S.E., M.P.H., *Clinical Instructor in*

Pediatric Psychiatry

Harold Plotsky, B.S., M.D., *Clinical Instructor in Pediatric Psychiatry*
 Albert Jay Modlin, M.S., M.D., *Clinical Instructor in Pediatrics*
 Jose Rafael Puig, M.D., *Clinical Instructor in Pediatrics*
 Nickolas Panagiolis Douridas, M.D., *Assistant in Pediatrics*
 Nicholas Peter Haritos, B.S., M.D., *Assistant in Pediatrics*
 Kyoung Hi Park, M.D., *Assistant in Pediatrics*
 William Norton Sterling, B.S., M.D., *Assistant in Pediatrics*
 Donald Wallis Wiczer, A.B., M.D., *Assistant in Pediatrics*

SPECIAL LECTURER

Myron Ezra Wegman, A.B., M.D., M.P.H., *Secretary General, Pan American Sanitary Bureau, Americas of World Health Organization; Pediatrics*

The Staff

256 *Pediatrics*

Spring—2 hours a week.

Lectures on physiology of the newborn, normal behavior, emotional and physical development, infant nutrition, diseases of the newborn, common anomalies and system illnesses of infancy and childhood. Medical School.

Howard and Staff

357-58 *Clinical Clerkship: General Pediatrics*

Two weeks as arranged during academic year.

Introduction to clinical pediatrics. Emphasis on bedside discussion and group seminars including the newborn. Ward rounds. Five students in rotation. D. C. General Hospital.

Reichelderfer and Staff

359-60 *Clinical Clerkship: Contagious Diseases*

Two weeks as arranged during academic year.

Conferences and bedside discussion on contagious and infectious diseases. Prevention and quarantine measures. Five students in rotation. D. C. General Hospital.

361-62 *Clinical Conferences I*

Min and Staff

Academic year—1 hour a week.

Required. Presentation and discussion by students of current patient problems. D. C. General Hospital.

363-64 *Ward Rounds*

Nicholson, Min, and Staff

Academic year—as arranged.

Bi-weekly ward rounds, with students and Resident Staff. D.C. General Hospital.

365-66 *Psychiatry*

Lourie and Staff

Academic year—as arranged.

Lectures on normal behavior and emotional development. Clinical case analysis.

457-58 *Clinical Clerkship*

Anderson and Staff

Six weeks as arranged during academic year.

Full time, including assignment to night and holiday admissions. Case studies on wards under direct Resident supervision. Ward rounds with Staff and Residents. Twelve students. Children's Hospital.

459-60 *Outpatient Clinics*

Reichelderfer

Academic year—as arranged.

Work in Medical and Specialty clinics including surgery, allergy, X-ray, child welfare, cardiology, dermatology, neurology, and child guidance. Children's Hospital.

461-62 *Clinical Pathological Conferences*

The Staff

Academic year—1 hour a week.

Clinical and pathological discussion of recent patient history and laboratory data. Children's Hospital.

463-64 *Section Conferences*

The Staff

Academic year—twice a week.

Discussion of clinical problems of diagnosis and treatment of current patients. Children's Hospital.

465-66 *Section Conferences*

The Staff

Academic year—1 hour a week.

Surgical diagnosis, pre- and post-operative management. Children's Hospital.

467-68 *Clinical Conferences II*

Goldblatt and Staff

Academic year—1 hour a week.

Required. Case presentation by students. Staff and student discussion of diagnosis and management. Medical School.

469-70 *Child Guidance and Development*

Lourie

Academic year—as arranged.

Clerkship in fourth year including Well Baby Clinic. Group and class conferences.

PHARMACOLOGY

- Paul Kenneth Smith, Ph.D., *Professor of Pharmacology, Executive Officer*
 Harold George Mandel, Ph.D., *Professor of Pharmacology*
 Ralph Grafton Smith, M.D., Ph.D., *Clinical Professor of Pharmacology*
 Bernard Beryl Brodie, Ph.D., *Professorial Lecturer in Pharmacology*
 Clarke Davison, Ph.D., *Associate Professor of Pharmacology*
 Peter Bruno Danneberg, M.D., *Assistant Professor of Pharmacology*
 Norman Henry Carey, Ph.D., *Assistant Research Professor of Pharmacology*
 Donald Bernard Roodyn, Ph.D., *Assistant Research Professor of Pharmacology*
 Giulio Guido Jacoli, Ph.D., *Research Fellow in Pharmacology*
 Morton Levitt, B.S. in S.S., B.S. in Phar., *Research Fellow in Pharmacology*
 Robert Sanford Rozman, M.S., *Research Fellow in Pharmacology*
 Lillemor Elena Spitzer, B.S., *Teaching Fellow in Pharmacology*
 William Robert Sterling, B.S., M.D., *Research Fellow in Pharmacology*
 Ernest Frederick Zimmerman, B.S., *Research Fellow in Pharmacology*

SPECIAL LECTURER IN PHARMACOLOGY

- William Vincent Crahan Leahy, Ph.D., *Assistant Chief, Radioisotope Service, Veterans Administration Hospital, Washington, D.C.*

249-50 *Introduction to Medical Research** (3-3)

The Staff

Academic year—Sat., 8:00 A.M. to 1:00 P.M.

Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

261 *Pharmacology* (5)

The Staff

Fall—5 hours a week.

Lectures and conferences concerning the interaction of drugs and biological systems as a basis for the rational therapy of disease. Open to qualified nonmedical students.

* This is an interdepartmental course. The student should register in the department directing his research.

- 262 *Chemotherapy* (1) The Staff
 Spring—1 hour a week.
 Continuation of Pharmacology 261.
- 263 *Pharmacology Laboratory* (1) The Staff
 Fall—3 hours a week.
 Laboratory instruction and demonstrations designed to complement Pharmacology 261. Open to qualified nonmedical students. The Staff
- 267-68 *Pharmacological Research* (arr.)
 Academic year—as arranged.
 Primarily for those properly qualified graduate and medical students seeking careers in pharmacology. The Staff
- 269-70 *Pharmacology Seminar* (1-1)
 Academic year—2 hours a week.
 Recent advances in pharmacology. For those interested in pharmacological research. Open to qualified nonmedical students. The Staff
- 279-80 *Special Methods in Research* (arr.)
 Academic year—as arranged.
 A course to familiarize the student with advanced biochemical, microbiological, and physiological methods employed in pharmacological investigations. Open to qualified nonmedical students. The Staff
- 299-300 *Thesis* (3-3)
 Academic year—as arranged.
 Required of Master of Arts and Master of Science candidates.

PHYSICAL MEDICINE AND REHABILITATION

Charles Samuel Wise, B.S., M.D., *Professor of Physical Medicine and Rehabilitation, Executive Officer*

John Watt, Jr., M.D., *Assistant Professor of Physical Medicine and Rehabilitation*

Alvin Knudson, B.S., M.D., *Associate in Physical Medicine and Rehabilitation*

Francis Liell Wenger, M.D., *Associate in Physical Medicine and Rehabilitation*

Charles Raymond Peterson, M.D., *Fellow in Physical Medicine and Rehabilitation*

Jessie Elizabeth Fair, M.C.S.P., R.P.T., *Assistant in Physical Medicine and Rehabilitation*

Kyoko Ishiyama, B.S., R.P.T., *Assistant in Physical Medicine and Rehabilitation*

150 *Elements of Physical Medicine*

Spring—as arranged.

The Staff

In arrangement with the Anatomy Department, lectures and demonstrations of the various tests and measurements are employed in the evaluation of physical disability.

352 *Advanced Physical Medicine*

Spring—1 hour a week.

The Staff

Lectures and demonstrations concerning the various techniques, clinical applications of physical medicine and rehabilitation to be integrated with the teaching of the associated medical and surgical specialties.

467-68 *Clinical Studies*

Academic year—as arranged.

The Staff

Clinical teaching and demonstration at the University Hospital.

485 *Research (arr.)*

Fall—as arranged.

The Staff

Open to medical students and qualified nonmedical students.

PHYSIOLOGY

Chester Elwood Leese, Ph.D., *Fry Professor of Physiology*
Charles Adrian Michael Hogben, M.D., Ph.D., *Professor of Physiology*
Executive Officer

William Rankin Duryee, Ph.D., *Research Professor of Physiology*
Eugene Marshall Renkin, Ph.D., *Associate Professor of Physiology*
Friedrich Paul Julius Diecke, Dr. rer. nat., *Associate Professor of Physiology*

Ruth McClintock, Ph.D., *Assistant Professor of Physiology*
Charles Stanley Tidball, Ph.D., *Assistant Research Professor of Physiology*

Joseph Frederick Hoffman, Ph.D., *Lecturer in Physiology*
David Platt Rall, M.D., Ph.D., *Lecturer in Physiology*
Eugene Braunwald, A.B., M.D., *Lecturer in Physiology*
Saul Winegrad, A.B., M.D., *Associate in Physiology*
Paul Glenwood Linaweaver, Jr., M.S., M.D., *Associate in Physiology*
Doris Margaret Nicholls, Ph.D., M.D., *Associate in Physiology*
Muniswamappa Basavaraju, M.B., B.S., *Teaching Fellow in Physiology*

SPECIAL LECTURER

Stanley Jay Sarnoff, A.B., M.D., *Chief, Laboratory of Cardiovascular Physiology, National Heart Institute, National Institutes of Health*
Cardiovascular Physiology

115 *Physiology* (3)

Fall: section A—Tues. and Thurs., 8:45 to 10:00 A.M.; section B—Tues. and Thurs., 5:10 to 6:25 P.M.

Lectures for nonmedical students covering the fundamentals of physiology in its various subdivisions. Prerequisite: one year of general science or one semester of a biological science. Prerequisites and time subject to change 1960-61.

117 *Experimental Physiology* (1)

Fall—Fri., 2:10 to 5:10 P.M.

Laboratory exercises in the fundamentals of physiology for nonmedical students. Prerequisite or concurrent registration: Physiology 115 or the equivalent. Material fee, \$18. Prerequisites and time subject to change 1960-61.

120 *Physiology of Endocrine Activity* (2)

The Staff

Not offered 1960-61.

For nonmedical students. The circulatory, metabolic, reproductive, growth, and other adaptations immediate and long term, accompanying and affecting endocrine activity. Prerequisite: Physiology 115 or the equivalent.

130 *The Psycho-physiology of Personality* (2)

Leese

Spring—Tues. and Thurs., 5:10 P.M.

For nonmedical students. Lectures on the genesis and expression of personality, with emphasis on the physiological approach. Prerequisite: Physiology 115 or the equivalent and general psychology.

149-50 *Medical Physiology*

Hogben and Staff

Fall—4 hours a week; spring—14 hours a week.

Lectures and laboratory work in all divisions of Physiology. This course is designed for medical students.

211-12 *Problems in Physiology* (arr.)

Leese

Academic year—as arranged.

For nonmedical graduate students. Open to undergraduate students with the approval of the Department. Prerequisite: Physiology 115 and 117, or the equivalent.

221-22 *Physiology Seminar* (1-1)

Renkin

Academic year—1 hour a week, as arranged.

For nonmedical students undertaking graduate work in physiology. Prerequisite: Physiology 115 and 117, or the equivalent.

231-32 *Advanced Physiology* (6-6)

Renkin and Staff

A year course: credit is not given for the first half until the second half is completed.

Fall—4 hours a week; spring 14 hours a week, as arranged.

For nonmedical graduate students. Lectures and laboratory work in all major areas of physiology. Physiology 232: material fee, \$42.

241 *Advanced Physiology of the Cell* (1)

Duryee

Fall—1 hour a week, as arranged.

For nonmedical graduate students. Special emphasis on biophysics and the biochemistry of the cell in relation to organ function.

249-50 *Introduction to Medical Research** (3-3)

The Staff

Academic year—Sat., 8:00 A.M. to 1:00 P.M.

Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

269-70 *Pharmacologic Physiology* (1-1)

The Staff

Academic year—one hour a week, as arranged.

Recent advances in physiology and pharmacology for those interested in research. Open to qualified medical and nonmedical students.

279 *Topics in Physiology* (1)

The Staff

Fall—one hour a week, as arranged.

Review of the active areas of research. Open to qualified medical and graduate students. Prerequisite: Physiology 150 or 232.

295-96 *Research* (arr.)

The Staff

Academic year—as arranged.

The Staff

299-300 *Thesis* (3-3)

* This is an interdepartmental course. The student should register in the department directing his research.

PSYCHIATRY

Winfred Overholser, A.B., M.D., Sc.D., L.H.D., *Professor Emeritus of Psychiatry in Residence*

- Leon Yochelson, A.B., M.D., *Professor of Psychiatry, Executive Officer*
 Joel Elkes, M.B., Ch.B., M.D., *Clinical Professor of Psychiatry*
 Henry Prather Laughlin, B.S., M.D., *Associate Clinical Professor of Psychiatry*
 Marshall deGraffenried Ruffin, B.S., M.D., *Associate Clinical Professor of Psychiatry*
 Sidney Berman, B.S., M.D., *Associate Clinical Professor of Psychiatry*
 Morris Kleinerman, B.S., M.D., *Associate Clinical Professor of Psychiatry*
 Elmer Klein, B.S., M.D., *Associate Clinical Professor of Psychiatry*
 Anna Coyne Todd, A.B., M.D., *Associate Clinical Professor of Psychiatry*
 Norman Taub, B.S., M.D., *Associate Clinical Professor of Psychiatry*
 Joseph Eugene Rankin, B.S., M.D., *Assistant Professor of Psychiatry*
 Harold Corson, M.D., *Assistant Clinical Professor of Psychiatry*
 Sarah Shtoffer Tenenblatt, A.B., M.D., *Assistant Clinical Professor of Psychiatry*
 Richard Schaengold, B.S., M.D., *Assistant Clinical Professor of Psychiatry*
 Leon Ferber, A.B., M.D., *Assistant Clinical Professor of Psychiatry*
 David Eden, A.B., M.D., *Associate in Psychiatry*
 Robert Milton Greenberg, A.B., M.D., *Associate in Psychiatry*
 Helen Pallister, Ph.D., *Associate in Psychiatry (Psychology)*
 Christopher Theodore Bever, A.B., M.D., *Associate in Psychiatry*
 Warren Charles Johnson, B.S., M.D., *Associate in Psychiatry*
 Richard Allan Rogers, B.S., M.D., *Clinical Instructor in Psychiatry*
 John Anthony Farrell, M.D., *Clinical Instructor in Psychiatry*
 Wilmer Deaver Kehne, A.B., M.D., *Clinical Instructor in Psychiatry*
 Herman Arnold Meyersburg, B.S., M.D., *Clinical Instructor in Psychiatry*
 Samuel Chrabolowski Gordon, M.D., *Clinical Instructor in Psychiatry*
 Harold Bernard Lehrman, A.B., M.D., *Clinical Instructor in Psychiatry*
 Randolph Adams Frank, A.B., M.D., *Clinical Instructor in Psychiatry*
 Maxwell Boverman, A.B., M.D., *Clinical Instructor in Psychiatry*
 Helen Glick Percy, A.B., M.S.W., *Clinical Instructor in Psychiatry (Social Work)*

Alan McCulloch Drummond, A.B., M.D., *Clinical Instructor in Psychiatry*

George Warren Sprehn, M.D., *Clinical Instructor in Psychiatry*

Norman Charles Rintz, A.B., M.D., *Clinical Instructor in Psychiatry*

Leslie Schaffer, M.B., Ch.B., *Clinical Instructor in Psychiatry*

Joseph Lee Sheridan, A.B., M.D., *Clinical Instructor in Psychiatry*

Leonard J. Duhl, A.B., M.D., *Clinical Instructor in Psychiatry*

George Wilcox Metcalf, M.D., *Clinical Instructor in Psychiatry*

Marvin Earl Perkins, A.B., M.D., M.P.H., *Clinical Instructor in Psychiatry*

Sidney Lee Werkman, A.B., M.D., *Clinical Instructor in Psychiatry*

Charles Arnold Bohrer, M.D., *Assistant in Psychiatry*

165 *Introductory Medical Psychology*

Berman

Fall—1 hour a week.

An orientation course in the anatomical, physiological, and psychological growth and development of personality. Consideration of characteristics of structure, function, and development of the psyche leading to normal behavior as a basis for the study of the pathological. Evaluation of interpersonal relationships.

Rankin

178 *Psychopathology*

Spring—1 hour a week.

Manifestations and understanding of various mental mechanisms and abnormal reaction-types, preceded by history of development of psychopathology and illustrated with case material.

Overholser

266 *Psychiatry*

Spring—1 hour a week.

History, etiology, symptoms, course, and treatment of the major psychoses with emphasis on the dynamics involving the person as a whole.

268 *Demonstration Clinics*

Taub, Tenenblatt, Schaengold

Spring—3 hours a week.

Presentation of clinical cases of major mental illnesses and primary behavior disturbances, correlating with Psychiatry 266. Each student examines patients under supervision. St. Elizabeths and D. C. General hospitals.

Ruffin

272 *Psychosomatic Aspects of General Medicine*

Spring—1 hour a week.

Somatic disorders of psychogenic origin. The role of personality reactions in functional and organic disorders.

324 *Psychoneurosis*

Laughlin

Spring—1 hour a week.

Etiology, psychopathology, clinical aspects, and treatment of various types of psychoneuroses. Medical Conference Room, D. C. General Hospital.

431-32 *Clinical Clerkship*

The Staff

Three weeks divided service as arranged during academic year.

Supervised examination, diagnosis, and treatment of ambulatory borderline cases in University Hospital and hospitalized cases in St. Elizabeths Hospital. Conferences for discussion of cases. Clinical application of psychiatric principles to general medical practice is stressed. University Hospital Inpatient and Outpatient Psychiatric clinics and St. Elizabeths Hospital.

RADIOLOGY

- William Woodrow Stanbro, M.D., *Professor of Radiology, Executive Officer*
 Charlotte Patricia Donlan, A.B., M.D., *Assistant Professor of Radiology*
 Solomon Rodney Bersack, B.S., M.D., *Assistant Clinical Professor of Radiology*
 Harry Jay Kicherer, M.D., *Assistant Clinical Professor of Radiology*
 Harry Louis Berman, B.S., M.D., *Assistant Clinical Professor of Radiology*
 John Alexander Isherwood, Ph.B., M.D., *Assistant Clinical Professor of Radiology*
 Elmer Richard King, A.B., M.D., *Assistant Clinical Professor of Radiology*
 Alvin Charles Wyman, A.B., M.D., *Associate in Radiology*
 Herman Litwer, M.D., *Associate in Radiology*
 Scott Winfield Smith, Ph.D., *Associate in Radiology*
 Nan Van Wagenen, B.S., M.D., *Instructor in Radiology*
 George Tievsky, B.S., M.D., *Clinical Instructor in Radiology*
 Uthai Vincent Wilcox II, M.D., *Clinical Instructor in Radiology*
 Charles Malcolm Weber, M.D., *Clinical Instructor in Radiology*
 Palma Abraham, M.D., *Assistant in Radiology*
 Emmett Monroe Cooper, M.D., *Assistant in Radiology*
 Ryun Ho Kim, M.D., *Assistant in Radiology*
 Mohamad Sadegh Navabpour, M.D., *Assistant in Radiology*
 Warren James Nelson, B.S., M.D., *Assistant in Radiology*
 Roger Hall Shannon, A.B., M.D., *Assistant in Radiology*

115-16 *Anatomy*

Academic year—as arranged.

Correlation of gross and Roentgen anatomy.

220 *Principles of Radiology*

Spring—1 hour a week.

Lectures and discussions.

313 *Advanced Radiological Diagnosis*

Fall—as arranged.

Lectures and discussions.

421-22 *Clinical Studies*

Students are assigned to the X-ray Department in rotation on a full-time basis for a specific period.

SURGERY

- Brian Blades, A.B., M.D., *Professor of Surgery, Executive Officer*
 Arch Lockhart Riddick, B.S., M.D., *Clinical Professor of Surgery*
 William Stanley McCune, A.B., M.D., *Clinical Professor of Surgery*
 Vincent Michael Iovine, B.S., M.D., *Clinical Professor of Surgery*
 Alec Horwitz, M.S., M.D., *Clinical Professor of Surgery*
 George Alfred Higgins, Jr., B.S., M.D., *Clinical Professor of Surgery*
 Calvin Trexler Klopp, A.B., M.D., *Warwick Associate Professor of Surgery (Cancer)*
 John Pletch Adams, B.S., M.D., *Associate Clinical Professor of Orthopedic Surgery*
 Howard Clemeth Pierpont, A.B., M.D., *Assistant Professor of Surgery*
 Paul Charles Adkins, A.B., M.D., *Assistant Professor of Surgery*
 Benjamin Franklin Dean, Jr., M.D., M.S., *Assistant Clinical Professor of Surgery*
 Carl Berg, M.D., *Assistant Clinical Professor of Orthopedic Surgery*
 Julius Salem Neviaser, A.B., M.D., *Assistant Clinical Professor of Orthopedic Surgery*
 Jerome Blaine Harrell, M.D., *Assistant Clinical Professor of Surgery*
 Leonard Theodore Peterson, B.S., M.D., *Assistant Clinical Professor of Orthopedic Surgery*
 Gordon Sparks Letterman, B.S., M.D., *Assistant Clinical Professor of Surgery*
 Henry Leon Feffer, A.B., M.D., *Assistant Clinical Professor of Orthopedic Surgery*
 James Richard Thistlethwaite, B.S., M.D., *Assistant Clinical Professor of Surgery*
 Thomas Bradley, A.B., M.D., *Assistant Clinical Professor of Surgery*
 William Ross Morris, M.D., *Associate in Surgery*
 Jacob Joseph Weinstein, B.S., Phar.G., M.D., *Associate in Surgery*
 William Carey Meloy, M.D., M.S. in Med., *Associate in Surgery*
 Edward Alexander Cafritz, M.D., *Associate in Surgery*
 Karl Hayden Wood, Phar.G., D.D.S., *Associate in Dental Surgery*
 Isabella Harrison, A.B., M.D., *Associate in Surgery*
 Nicholas Patrick Dillon Smyth, M.S., M.B., Ch.B., *Instructor in Surgery*
 Richard Kenneth Hughes, A.B., M.D., *Instructor in Surgery*
 Crenshaw Douglas Briggs, B.S., M.D., *Clinical Instructor in Surgery*
 Joseph Francis Conlon, D.D.S., *Clinical Instructor in Dental Surgery*
 Duane Case Richtmeyer, A.B., M.D., *Clinical Instructor in Surgery*
 Leon Gerber, M.D., *Clinical Instructor in Surgery*
 Ernest Alva Gould, B.S., M.D., *Clinical Instructor in Surgery*

- Austin Bertram Rohrbaugh, Jr., A.B., M.D., *Clinical Instructor in Orthopedic Surgery*
 Marvin Hayne Kendrick, A.B., M.D., *Clinical Instructor in Surgery*
 Brooks Gideon Brown, M.D., *Clinical Instructor in Surgery*
 John Decator Hoyle, B.S., M.D., *Clinical Instructor in Surgery*
 Robert Roland Smith, B.S., M.D., *Clinical Instructor in Surgery*
 Norman Harry Isaacson, A.B., M.D., *Clinical Instructor in Surgery*
 Charles Stanley White, Jr., B.S., M.D., *Clinical Instructor in Surgery*
 Dennis Parfremment McCarty, M.D., *Clinical Instructor in Surgery*
 John Mark Keshishian, M.D., *Clinical Instructor in Surgery*
 Maxine Ann Schurter, A.B., M.D., *Clinical Instructor in Surgery*
 Theodore Crandall Alford, A.B., M.D., *Clinical Instructor in Surgery*
 Robert LeRoy Dow, A.B., M.D., *Clinical Instructor in Orthopedic Surgery*
 Louis Robert Perna, A.B., M.D., *Clinical Instructor in Surgery*
 Thomas Mahlon Wright, A.B., M.D., *Clinical Instructor in Surgery*
 David Colwell Wherry, A.B., M.D., *Clinical Instructor in Surgery*
 Murdock Head, M.D., D.D.S., LL.B., *Fellow in Plastic Surgery*
 Barrett Christian Anderson, A.B., M.D., *Assistant in Surgery*
 Harry Irving Dubow, B.S., M.D., *Assistant in Surgery*
 John Jacob Evans, M.S., M.D., *Assistant in Surgery*
 Edward Hiroshi Izawa, A.B., M.D., *Assistant in Surgery*
 Victor Liszka, M.D., *Assistant in Surgery*
 Elden Mohr, B.S., M.D., *Assistant in Surgery*
 Robert Dean Phillips, B.S., M.D., *Assistant in Surgery*
 Louis Quain Pugsley, A.B., M.D., *Assistant in Surgery*
 Robert Peter Riker, B.S., M.D., *Assistant in Surgery*
 Paul Shorb, Jr., A.B., M.D., *Assistant in Surgery*
 David Forsythe Smith, M.D., *Assistant in Surgery*
 John Alexander Tolley III, A.B., M.D., *Assistant in Surgery*

101-2 *Surgical Anatomy I*

Surgery and Anatomy Staffs

Academic year—1 hour alternate weeks, as arranged.
 Clinics illustrating relationship between gross anatomy and clinical surgery. University Hospital.

284 *Surgical Physiology*

Spring—2 hours a week.

A clinical and laboratory course with particular emphasis on applied physiology.

The Staff

Weiss

323-24 *Surgical Pathology I*

Academic year—1 hour a week.

Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing surgical specimens.

- 373-74 *Clinical Clerkship I* The Staff
 Academic year—as arranged.
 The student is assigned and required to work up thoroughly the cases for diagnosis and treatment. D. C. General Hospital.
- 375-76 *Outpatient Surgical Clinic* The Staff
 Forty hours as arranged during academic year.
 Surgical clinic. D. C. General Hospital.
- 377 *Fractures and Orthopedics* The Staff
 Fall—1 hour a week.
 Lectures covering the field of fractures and orthopedics. D. C. General Hospital.
- 379-80 *Lectures in Surgery* The Staff
 Academic year—2 hours a week.
 D. C. General Hospital.
- 383-84 *Surgical Clinic* Blades
 Academic year—1 hour a week.
 Demonstration of various surgical diseases to the entire class. University Hospital.
- 473-74 *Clinical Clerkship II* The Staff
 Academic year—in rotation.
 Six weeks, University Hospital; three weeks, Mt. Alto Hospital.
- 479-80 *Surgical Staff Conferences* The Staff
 Academic year—Wednesday as arranged.
 University Hospital.
- 483-84 *Surgical Ward Rounds* Blades
 Academic year—1 hour a week.
 Demonstration of various surgical diseases to fourth-year clerks. University Hospital.
- 491 *Surgical Anatomy II* Horwitz and Staff
 Fall—1 hour a week for twelve weeks in rotation.
 Lectures for fourth-year clerks. University Hospital.
- 492 *Surgical Pathology II* Newman
 Spring—1 hour a week.
 A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically.

UROLOGY

Edward Egner Ferguson, M.D., *Associate Clinical Professor of Urology*
 Leon Richard Culbertson, B.S., M.D., *Associate Clinical Professor of Urology, Executive Officer*
 William Dabney Jarman, B.S., M.D., *Assistant Clinical Professor of Urology*
 Gilbert Ottenberg, A.M., M.D., *Associate in Urology*
 Gordon Rhodes MacDonald, B.S., M.D., *Associate in Urology*
 Frederick Turner Reuter, M.D., *Associate in Urology*
 Herbert DeGrange Wolff, Jr., M.D., *Clinical Instructor in Urology*
 Hamilton Peacock Dorman, B.S., M.D., *Clinical Instructor in Urology*
 Herbert Abraham Goldberg, M.B., Ch.B., *Clinical Instructor in Urology*
 William David Oldham, B.S., M.D., *Clinical Instructor in Urology*

395-96 Clinic

Clinical teaching and demonstrations on the care of urological patients with special emphasis on the pre- and post-operative management. Operative clinics and clinical teaching. D. C. General Hospital. The Staff

397 Urology

Fall—1 hour a week.

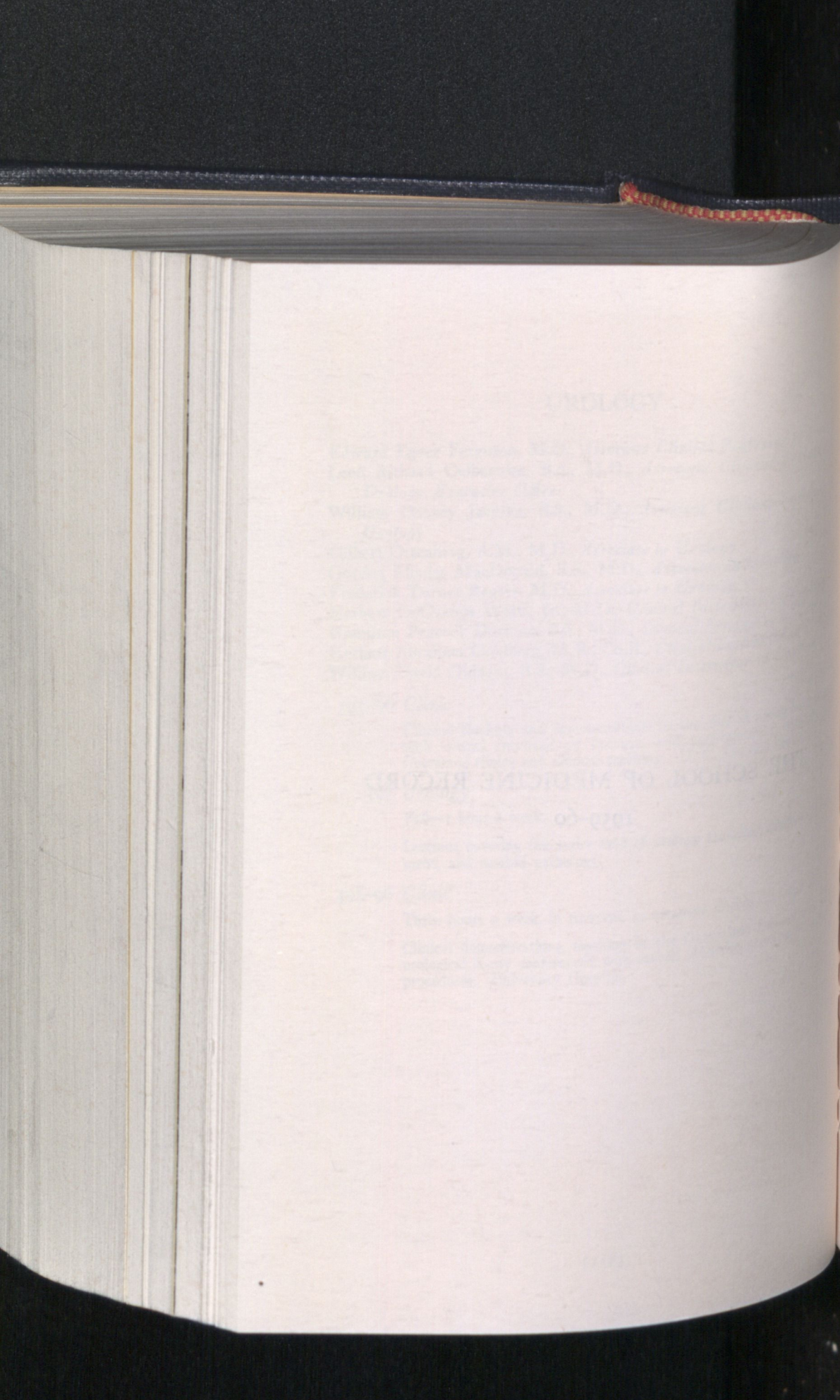
Lectures covering the entire field of urology including diagnosis, treatment, and morbid pathology. The Staff

495-96 Clinic

Three hours a week, in rotation, as arranged during academic year.

Clinical demonstrations, teaching in the Outpatient Department, and urological X-ray conferences, with special attention given to diagnostic procedures. University Hospital. The Staff

THE SCHOOL OF MEDICINE RECORD
1959-60



DEGREES CONFERRED

DOCTOR OF MEDICINE

JUNE 3, 1959

Arnold Benjamin Barr (With distinction) A.B. 1956, The George Washington University	D.C.	Glenn Charles Hillery Donald Edwin Holt A.B. 1954, University of California	Wis. Calif.
Alan Brent Barton A.B. 1955, University of California at Los Angeles	Calif.	Ward Bullard Hurlburt A.B. 1956, The George Washington University	D.C.
Edward August Behnke Samuel Michael Belinsky A.B. 1955, University of Bridgeport	Va.	Albert Bernhard Iben Edward William Jackson	Va.
John Russell Blodgett, Jr. Erwin Allen Bondareff B.S. in Phar. 1952, The George Washington University	Conn.	James Edwin Jackson B.S. 1950, Morehouse College	Va. Ga.
Ronald Jack Bortnick (With distinction) A.B. 1956, The George Washington University	Calif.	Don Robert Johnson A.B. 1955, Princeton University	Md.
Harry Silsby Brown, Jr. A.B. 1952, University of Missouri	Md.	John Edward Kelly James Furman Kemp	N.Y. D.C.
James Domonick Cozzarelli B.S. 1955, St. John's University	D.C.	A.B. 1955, University of Utah Richard Beaman Killen, Jr.	Fla.
Richard Bruce Crabb A.B. 1957, Duke University	Mo.	Robert Samuel Lufbery Kinder (With distinction)	R.I.
Ruth Dickerson A.B. 1956, The George Washington University	N.J.	A.B. 1951, Brown University	Conn.
Fred McEwen Downey, Jr. A.B. 1956, Duke University	Pa.	Anthony Speaker King A.B. 1953, Williams College	N.Y.
Arland Kenneth Faust A.B. 1955, University of Kansas	D.C.	Alan Usher Klatsky A.B. 1955, Yale University	Md.
John LeRoy Fox (With distinction) A.B. 1955, Haverford College	D.C.	James Robert Klineberg (With distinction)	
John Carl Frich DeLamar Johnson Gibbons B.S. 1956, Utah State Agricultural College	Kans.	A.B., A.M. 1955, Johns Hopkins University	N.Y.
Martin Alan Ginsburg A.B. 1955, Lehigh University	D.C.	Charles Konia A.B. 1955, New York University	N.Y.
Leonard Herbert Glassman B.S. 1955, Franklin and Marshall College	D.C.	Lewis Henry Kuller A.B. 1955, Hamilton College	Ohio
Bernard Gondos B.S. 1956, Yale University	Md.	Frank Albert Kunkle Peter John Kyne	D.C.
Charles Martiros Griffin, Jr. A.B. 1952, Boston University	Pa.	B.S. 1955, The George Washington University	N.J.
M.S. in P.H. 1951, Columbia University	Utah	Stephen Arthur Landaw (With distinction)	
John Khouri Haddad (With distinction) A.B. 1953, Cornell University	Va.	B.S. 1956, University of Wisconsin	Md.
Alan Curtis Hampshire A.B. 1953, Amherst College	N.J.	Paul Frank Larson Frank John Laudonio	N.Y.
Monte Arnold Herman A.B. 1956, The George Washington University	Va.	A.B. 1955, Columbia University	D.C.
	D.C.	Philip Lazaroff Samuel Eugene Long	N.Y.
	N.Y.	B.S. 1955, Wagner Lutheran College	Ala.
	R.I.	Joseph Allen Lowman, Jr. B.S. 1951, University of Alabama	Pa.
	D.C.	Francis Kirkwood Mainzer A.B. 1952, Amherst College	Mass.
		William Joseph McAweeney A.B. 1955, Providence College	N.Y.
		Anthony Matthew Miceli B.S. 1954, Wagner Lutheran College	Wash.
		Alden Hamilton Miller B.S. 1956, State College of Washington	Pa.
		Robert Bruce Montgomery B.S. 1955, University of Maryland	Wis.
		Thomas Mathew Mould B.S. 1951, University of Wisconsin	Va.
		Mark Edwin Nesbit, Jr. B.S. 1955, University of Wisconsin	

Harding William Olson	N.Y.	Peter Robert Rugani	N.Y.
B.S. 1951, Kent State University		A.B. 1951, New York University	
Beale Hibbs Ong	Md.	A.M. 1955, Columbia University	
A.B. 1955, The George Washington University		Edward Underwood Scherer, Jr.	
Ronald I. Ottenberg	D.C.	B.S. 1955, Haverford College	
A.B. 1956, The George Washington University		Gilbert Roland Schoefer	
Pedro Mario Pabon-Gomez	Puerto Rico	A.B. 1955, Stanford University	
A.B. 1955, Polytechnic Institute of Puerto Rico		Gordon Eugene Seck	
Robert Marr Payne	Va.	B.S. 1953, University of California	
B.S. 1955, Brigham Young University		Leroy Allen Seftel	
Manuel Perez-Gonzales	N.Y.	B.S. 1955, Rutgers University	
B.C.E. 1944, College of the City of New York		Joan Adele Shapiro	
Diane Patricia Perrine	Calif.	(With distinction)	
A.B. 1955, San Francisco State College		B.S. 1955, Rutgers University	
Kent Albrecht Peterson	Md.	Marcus Boyd Shook	
A.B. 1956, The George Washington University		George Louis Sigalos	
Jurgen Francis Piper	Md.	A.B. 1955, Lafayette College	
Joseph Vincent Pistone	Va.	John Joseph Smith	
B.S. in Phar. 1954, The George Washington University		A.B. 1955, Seton Hall University	
William Lloyd Pogue	Md.	Edmund Allan Speidell	
A.B. 1955, Williams College		A.B. 1955, Williams College	
Fredric Carl Porton	D.C.	Eugene Field Taylor, Jr.	
A.B. 1956, The George Washington University		David Berl Van Every	
William Alfred Powell	D.C.	A.B. 1955, University of California at Los Angeles	
A.B. 1953, Ohio Wesleyan University		John Russell Wadleigh	
A.M. 1955, Williams College		A.B. 1956, The George Washington University	
Theodore Robert Purcell	Calif.	Charles Stanley Walkoff	
A.B. 1950, B.S. 1953, University of California		Melvin Clayton Williams	
Drake Richey	W.Va.	Wilfred LeRoy Williams	
A.B. 1955, West Virginia University		B.S. 1955, Whitworth College	
Rulon Douglas Robison	Idaho	Paul Ming Hsung Yen	
B.S. 1955, Brigham Young University		(With distinction)	
		B.S. 1955, University of Redlands	
		Ira Sanders Young	
		A.B. 1955, Lafayette College	
		Carmen Giovanni Yuppa	

STUDENTS REGISTERED IN THE SCHOOL OF MEDICINE*

1959-60

A

Abdu, Rashid Ali (IV)
A.B. 1956, Lafayette College
Akbarian, Mohammed (III)
A.B. 1957, The George Washington University
Albert, Bette Ponack (IV)
B.S. 1956, Tufts University
Allen, George Robert (II)
B.S. 1958, College of Idaho
Alley, Richard Hadley, Jr. (IV)
A.B. 1956, Occidental College
Alter, Burton Norman (III)
B.S. 1958, Yale University
Altman, Robert Lee (III)
B.S. 1957, Westminster College
Anderson, Arthur James (III)
Anderson, Kathryn Ann (II)
Ankeny, Scott Wayne (III)
A.B. 1954, University of California
Anstine, Lucille Alberta (IV)
B.S. 1956, The George Washington University
Antoniou, Lucy Denise (III)
A.B. 1958, The George Washington University
Apfelbaum, Herman Barton (II)
A.B. 1958, Dartmouth College
Aimont, Donna Jane (II)
A.B. 1955, Pacific Union College
Atwood, Roger Morris (III)
A.B. 1957, Carleton College

B

Baer, Howard Samuel (III)
A.B. 1957, Wesleyan University
Barday, William Anderson (I)
Barnhart, Robert Miller (III)
Barr, Mason, Jr. (III)
A.B. 1957, Haverford College
Barrett, James E. (II)
Beachy, Lester (I)
Beaver, Harry Carl (I)
B.S. 1959, Wheaton College
Bedau, Grover William (II)
A.B. 1958, College of the Pacific
Beman, John Albert (III)
A.B. 1958, Occidental College
Bell, Clyde Laurance, Jr. (II)
Bendler, Benne Gene (II)
Bertsch, Dale Roger (III)
Bish, Elizabeth Ann (I)
B.S. 1959, Purdue University
Bolton, Michael Edward (II)
A.B. 1958, LaSalle College
Bolter, Delano Woodrow (III)

Yemen

D.C.

D.C.

Idaho

Oreg.

Conn.

Md.

D.C.

Md.

Calif.

Pa.

D.C.

N.Y.

D.C.

Calif.

Minn.

Conn.

Pa.

Md.

Ohio

Mass.

Pa.

Pa.

Calif.

Calif.

D.C.

Ind.

Calif.

Ill.

Del.

Calif.

Bonbrest, Helen Constance (IV)
A.B. 1958, The George Washington University

Md.

Bowen, Gerald Thomas (IV)
Bowen, Violet Ella (III)
A.B. 1958, The George Washington University

Mich.

W.Va.

Bradley, Fenwick Philip (I)
Brie, Carol Rittenhouse (II)
B.S. 1958, University of Richmond

Wash.

D.C.

Brown, Joel Douglas (I)
Bru, Norman James (IV)
A.B. 1956, University of California

Md.

Calif.

Bruhn, John Richard (IV)
A.B. 1956, Carleton College

Ala.

Bruner, Blackwell Smith (I)
Brunt, Alfred William, Jr. (II)
Buchanan, Keith Elwyn (IV)

D.C.

Idaho

Wis.

B.S. 1956, University of Wisconsin
Buckingham, Frank Maurer (I)
A.B. 1959, University of Nebraska

N.J.

Bucknell, Thomas Edward (I)
Burger, George Franklin, Jr. (II)
B.S. in Phar. 1957, University of Pittsburgh

Calif.

Pa.

Burgess, Mary Josephine (IV)
A.B. 1956, Catholic University of America

N.Y.

Buscemi, Michael Frank (II)
B.S. 1957, Georgetown University

N.J.

Butler, James Shannon (I)
B.S. 1959, Juniata College

N.J.

Buxton, Terry Mackley (II)
B.S. 1959, University of Utah
Bystrom, John Theodore (I)

Idaho

Calif.

A.B. 1959, Stanford University

C

Call, Richard Grant (IV)
Calvo, Robert Camilo (III)
B.S. 1956, Rutgers University

Idaho

N.J.

Cameron, Don Bruce (IV)
A.B. 1952, University of California at Los Angeles

Calif.

Campbell, Constance Joan (III)
A.B. 1958, The George Washington University

Va.

Cantrell, Robert Wendell (IV)
A.B. 1958, The George Washington University

Mo.

Carlson, David Roland (IV)
B.S. in Phar. 1953, Drake University

Ill.

Carrell, William Dayton, Jr. (II)
A.B. 1957, Stanford University

Ariz.

Carter, Robert Lee (IV)
A.B. 1955, Washington and Jefferson College

W.Va.

* The year of registration in the School of Medicine is indicated in parentheses following the name of the student.

Case, Arnold Lowell (IV)
A.B. 1956, Yale University
Castell, Donald Overton (IV)
A.B. 1958, The George Washington University
Ceremask, Robert Joseph (IV)
B.S. 1956, Catholic University of America
Chambers, Clyde Frank, Jr. (III)
Chinn, Joyce Ann (II)
A.B. 1958, University of California
Chirls, Irving Allen (IV)
A.B. 1947, Harvard University
Choolitch, Melvin Perry (II)
Clay, John Peter (III)
A.B. 1956, Occidental College
Clevenger, Robert William (IV)
A.B. 1956, Duke University
Clothier, Walter James Kilburn, Jr. (II)
B.S. 1957, Carroll College
Cohan, Allan Berry (III)
A.B. 1957, The George Washington University
Cohen, Allen Barry (I)
Cohen, Paul Gary (I)
A.B. 1959, University of Buffalo
Cole, Sherwood Allan (IV)
A.B. 1956, University of Buffalo
Colella, Michael Edward (I)
A.B. 1959, Hamilton College
Colmey, Thomas Grosvenor (III)
A.B. 1957, Duke University
Conrad, Justin Lyle (III)
A.B. 1957, Northwestern University
Covell, Jack Phillip (III)
Cowell, Irvin Jack (III)
Crandall, Peter Lloyd (II)
A.B. 1958, San Jose State College
Crown, Ronald Francis (II)
B.S. 1958, American University
Cunningham, Edward Earl (IV)
A.B. 1952, Washington and Jefferson College
M.S. 1954, Duquesne University
Cutshall, Quay Bradley (I)
B.S. 1959, Washington State College

D

Dahlke, Francis Gene (III)
Daily, Charles Dennis, Jr. (IV)
D'Altorio, Ronald Anthony (I)
A.B. 1959, Washington and Jefferson College
Dancer, Jack T. (III)
B.S. 1957, University of Arizona
Davajan, Val (IV)
A.B. 1956, Stanford University
Dear, Stephen Randolph (I)
A.B. 1959, University of California
DeGroot, Jerry (IV)
A.B. 1951, University of Washington
DeMordaunt, Paul Roger (III)
Denaro, Frank, Jr. (I)
B.S. 1959, College of William and Mary
Denison, Edward Karl (I)
DeQuattro, Vincent Louis (IV)
B.S. 1955, University of California
Dermody, William Henry III (I)
B.S. 1959, University of Scranton
Derro, Robert Arthur (III)
A.B. 1957, Harvard University
Diaz-Granadas, Eseban (I)
B.S. 1959, Fordham University

Conn. DeVita, Vincent Theodore (III)
B.S. 1957, College of William and Mary
Md. Dolan, John Albert (III)
B.S. 1957, Georgetown University
Dornfield, Leslie (I)
A.B. 1959, Rutgers University
Droeschner, John Joseph, Jr. (IV)
Okla. A.B. 1951, Colgate University
Calif. Dunn, Ronald Edward (III)
B.S. 1957, University of Idaho
N.J. Duxbury, William John (IV)
B.S. in Phar. 1952, University of Wisconsin
E
Pa. Egeland, Robert E. (IV)
A.B. 1956, State University of Iowa
Wis. Eisenbaum, Sidney Leon (II)
D.C. A.B. 1958, Tulane University
Eisenstein, Elliot Martin (IV)
B.S. 1956, Franklin and Marshall College
D.C. Eufemio, Michael Anthony (IV)
N.Y. A.B. 1956, Cornell University
Evers, Joseph Adolph (IV)
B.S. 1953, University of California

F

Ill. Fagan, Walter John (I)
A.B. 1959, LaSalle College
N.D. Fazekas, Victor (IV)
Feroi, Edward Joseph (IV)
B.S. in Phar. 1955, Massachusetts College of Pharmacy
Ind. Finn, Richard Stanley (I)
Utah B.S. 1954, Rutgers University
Calif. Fleischner, Gerald Michael (I)
D.C. A.B. 1959, Lafayette College
Fleming, Peter Alan (III)
Pa. A.B. 1956, San Diego State College
Floyd, Harold Leopold (IV)
Foer, Warren Hillary (I)
Fogel, Michael Roy (II)
Wash. A.B. 1958, Haverford College
Fried, Morton George (III)
A.B. 1957, New York University

G

Wis. Gallant, Milton (III)
Mo. A.B. 1957, Rutgers University
Pa. Gantz, Frank Elwin, Jr. (IV)
Ganz, Joel S. (III)
Ariz. B.S. 1957, Bethany College
Calif. Gardner, Allen Stiles (IV)
B.S. 1956, College of William and Mary
Calif. Gardner, Harvey Rex (I)
A.B. 1958, University of California
Garman, Ray Fillmore (III)
A.B. 1957, Johns Hopkins University
Wash. Gates, Francis Kenneth, Jr. (III)
Idaho A.B. 1956, Occidental College
N.Y. Gering, Henry Smither (III)
B.S. 1957, The Citadel
W.Va. Ghatan, Djamsid (IV)
Calif. A.B. 1956, Susquehanna University
Giovannini, Andrew Manuel (III)
Pa. A.B. 1957, University of California
Mass. Glatch, Louis Frank, Jr. (IV)
A.B. 1956, Reed College
Colombia Goodman, David Henry (I)
A.B. 1959, University of Pennsylvania

Goodman, Julius Morton (IV) A.B. 1958, The George Washington University	Md.	Hoffman, Charles Jacobs (I) B.S. 1959, The George Washington University	D.C.
Goodman, Philip (IV) B.S. 1956, Union College	N.Y.	Hoffman, Michael George (II) B.S. 1958, University of Arizona	Ariz.
Graham, Ronald Milton (III) Greenberg, Peter Lyon (I)	Wash.	Hogan, William Francis (III) A.B. 1958, The George Washington University	Va.
Greisinger, Thomas Hopkins University A.B. 1957, Williams College	Ohio	Hogg, Charles Edgar (IV) Horowitz, Martin Ira (I)	Md. N.J.
Grimths, Charles Whitfield (II) Grimths, Harold Mayne (II)	Calif.	A.B. 1959, Rutgers University	D.C.
Grundon, William Gene (IV) A.B. 1956, San Diego State College	Calif.	House, Homer Charles (I) B.S. 1959, Washington and Lee University	Calif.
Guandolo, Vincent Livingston (II) Guiton, Carl Richard (III)	Md.	Hovey, Leslie Morris (I) A.B. 1959, University of California	Ohio
Gulak, Hubert Maury (II) B.S. 1958, Duquesne University	N.J.	Huffman, Ray Thomas (III) Huffman, Stanley Richard (I)	Ky.
Gunther, Ronald Edgar (IV) B.S. 1958, Utah State University of Agriculture and Applied Science	Pa.	B.S. 1959, University of Kentucky	D.C.
Gwin, Byron Charles II (II) A.B. 1955, Duke University	N.J.	Hung, Kin Lincoln (III) B.S. 1957, University of Maryland	Calif.
	D.C.	Hurt, Arthur Curtis III (II) A.B. 1958, Stanford University	Fla.
		Huster, Richard Hudson (II) A.B. 1958, Duke University	N.J.
		Hutton, John Evans, Jr. (II) A.B. 1953, Wesleyan University	
H			
Haddad, Barbara Jean (IV) B.S. 1955, University of Miami	Fla.	Iff, Anita (I)	Switzerland
Hagen, Harold Melton (IV) A.B. 1956, St. Olaf College	Minn.		
Hagley, Ray Russell (IV) A.B. 1957, Marshall College	W.Va.	J	
Hair, Carolyn Joyce (I) University of North Carolina	N.C.	Jackson, Mary Marcell (II) A.B. 1950, Montana State University	Alaska
Hall, Lorne Franklyn (IV) A.B. 1956, Duke University	Conn.	James, William Clymer (III) A.B. 1954, Harvard University	Pa.
Hanache, Jeanne Anne (II) A.B. 1958, College of New Rochelle	N.Y.	Janon, Edward A. (II) A.B. 1958, University of Pennsylvania	N.Y.
Haney, Leland Forest (II) B.S. 1958, University of Idaho	Idaho	Jardee, James Joseph (II) Jennings, John Howard (III)	Oreg. Mo.
Hanson, Eric James (IV) B.F.A. 1955, Pratt Institute	Md.	A.B. 1957, Central College	Wash.
Harvey, Jack Wayne (I) B.S. 1959, The George Washington University	W.Va.	Jinguji, Masaharu Gerald (IV) B.S. 1952, College of Puget Sound	Ohio
Hawkins, Forrest Glenn (IV) A.B. 1956, West Virginia University	W.Va.	Johnson, Bruce McCoy (III) A.B. 1957, Carleton College	Utah
Henderson, Robert Michael (II) Hendrich, Leroy Michael (IV)	N.M.	Johnson, Jack Stoddard (IV) Jones, Lawrence Alan (II)	Va.
Hiebert, Talmadge Gordon (II) A.M. 1954, University of Kansas	N.J.	Judd, Howard Lund (I)	Calif.
Higgins, Robert Michael (I) A.B. 1959, Johns Hopkins University	D.C.	K	
Hill, Richard Norman (I) A.B. 1959, Taylor University	Ill.	Kachmarick, John Alexander (II) Kadell, Barbara Marion (I)	Pa. N.Y.
Hirsch, Roger Earl (I) B.S. 1956, The George Washington University	Calif.	A.B. 1958, University of Michigan	Pa.
Hix, William Randolph (IV) A.B. 1958, The George Washington University	Ind.	Karetas, Julia Ann (I) B.S. 1959, Albright College	Md. N.Y.
Hixon, Clayton Allan (III) B.S. 1957, Fairmont State College	D.C.	Katz, Robert (III) Kauffman, Allen Lloyd (II)	N.Y.
Hobson, Robert Wayne II (I) B.S. 1959, The George Washington University	D.C.	B.S. 1958, Wagner Lutheran College	N.Y.
Hoexter, Barton (II) A.B. 1958, Kenyon College	Va.	Kaufman, Barry Melvyn (III) B.S. 1958, University of Wisconsin	W.Va.
	Ohio	Keefer, Frank Jay (III) A.B. 1957, Washington and Jefferson College	W.Va.
		Kelley, Severance Burrage (IV) A.B. 1956, Ohio University	W.Va.
		Kelly, Robert John (III) A.B. 1953, University of Missouri	Mont.
		King, Jerome Stovall (I) A.B. 1959, University of Virginia	Ohio

Knapp, Lois Estelle (III)
 B.S. 1957, Gustavus Adolphus College
 Koldinger, Ralph Eddy (I)
 A.B. 1959, Stanford University
 Knorr, Norman John (III)
 Kraut, Joseph William (IV)
 B.S. 1954, Georgetown University
 Kruse, John Collinson (I)
 A.B. 1959, Duke University
 Kuhlman, James M. (I)
 A.B. 1959, University of Michigan
 Kundin, Jack Earl (II)

L

Lanham, John Marc (II)
 B.S. 1952, College of Idaho
 LaPiana, Francis Gerald (II)
 Latimer, Ronald Gordon (III)
 A.B. 1958, The George Washington University
 Lazarus, Gerald Sylvan (I)
 A.B. 1959, Colby College
 Leake, Francis Marion (II)
 A.B. 1958, University of California
 Leonard, Hiram Joseph (I)
 A.B. 1959, State University of Iowa
 Lewis, Walter Jackson III (I)
 A.B. 1955, Birmingham Southern College
 Liebler, Fred Byron (II)
 B.S. 1958, University of Pittsburgh
 Liebler, George Andrew (II)
 B.S. 1958, University of Pittsburgh
 London, Dan L. (IV)
 Loop, Floyd Dorullis (II)
 B.S. 1958, Purdue University
 Loscher, William Robert (II)
 B.S. 1958, Washington State College
 Lucas, George Lamoyne (III)
 A.B. 1957, Ohio University
 Lumsden, Robert Macken (I)
 A.B. 1959, University of California at Los Angeles
 Lundie, William McKenzie (II)
 A.B. 1958, New York University
 Luthringer, David George (II)
 A.B. 1958, Princeton University
 Lyle, Sanford Philip (I)
 A.B. 1959, University of Rochester

M

Macnab, Betty Jane (I)
 B.S. 1959, University of Arizona
 Maggio, Margaret Mary (IV)
 Majors, Robert Powell, Jr. (III)
 B.S. 1957, Davidson College
 Manolukas, Paul Angelo (IV)
 B.S. 1959, University of Pittsburgh
 M.B.A. 1951, University of Pennsylvania
 Marlow, John Lloyd (III)
 B.S. 1957, Brigham Young University
 Marshall, John Housden Lane (II)
 B.S. 1958, University of Maryland
 Mason, James Kent (III)
 A.B. 1959, Montana State University
 Mason, John Keith (II)
 B.S. 1954, Rocky Mountain College
 Matan, Joseph Anthony (II)
 Mathis, Jacob Lenhardt, Jr. (III)
 A.B. 1957, University of California
 Mayson, Preston Brooks, Jr. (II)
 B.S. 1955, U. S. Military Academy

D.C. Mazella, Samuel Frank (III)
 A.B. 1957, Cornell University
 Calif. McBeath, Jo Kent (II)
 B.S. 1957, Idaho State College
 Md. McBride, Albert (I)
 Ill. McCreedy, James Edward (II)
 B.S. 1958, Westminster College
 Ohio McDonald, Duncan Keith (IV)
 A.B. 1959, Williams College
 Mich. McGuire, Francis Donald (III)
 A.B. 1957, New York University
 N.J. McKay, Donald (III)
 A.B. 1955, Harvard University
 Meade, William Spencer (I)
 B.S. 1957, The George Washington University
 Idaho Mermel, John Frederick (IV)
 Calif. B.S. 1956, Georgetown University
 Md. Merrill, Keith West (I)
 Meymandi-Nejad, Assadullah (II)
 N.Y. Micale, Joseph Nicholas (II)
 B.S. 1957, Rutgers University
 Calif. Michelis, Michael Frank (I)
 A.B. 1959, Columbia University
 Iowa Mihalakis, Isidore (II)
 B.S. 1958, Moravian College
 Ala. Mileto, Dominica Anne (IV)
 B.S. 1956, Hood College
 Pa. Miller, Jay Howard, Jr. (III)
 B.S. 1957, The George Washington University
 Pa. Miller, Meredith Hodes (I)
 A.B. 1959, Johns Hopkins University
 Utah Minas, Thomas Folk (I)
 Ind. A.B. 1956, University of Arizona
 Mindel, Eugene David (IV)
 Calif. B.S. 1956, University of Maryland
 Modlin, Barry (I)
 Ohio B.S. 1958, M.S. 1959, The George Washington University
 Calif. Moede, Austin Lyn (I)
 A.B. 1959, University of California
 Mondzac, Allen Mendel (III)
 A.B. 1958, The George Washington University
 N.Y. Moore, James Reardon, Jr. (III)
 D.C. B.S. 1957, The George Washington University
 N.Y. Morgan, Walter Albert (IV)
 A.B. 1958, The George Washington University
 Ariz. Morledge, Thomas Edison (III)
 B.S. 1955, University of Arizona
 N.J. Morrell, Robert Henry (II)
 N.C. B.S. 1958, University of Oregon
 Va. Mrkich, Robert (I)
 A.B. 1959, University of Utah
 Mullen, Ronald Eugene (II)
 A.B. 1959, Marion College
 B.D. 1956, Northern Baptist Theological Seminary
 Idaho Myers, Charles Hammett (IV)
 D.C. A.B. 1953, University of North Carolina
 N
 Mont. Nachajski, Peter John (IV)
 A.B. 1956, Brown University
 Mont. Nelson, Manfred R. (II)
 Md. Nemeth, Charles (III)
 Calif. Nickerson, Richard George (II)
 S.C. A.B. 1958, New York University

Nicklas, Richard Austin (I) A.B. 1958, Cornell University	D.C.	Rundle, Herman Lloyd (II) A.B. 1958, University of California at Los Angeles	Calif.
Nutter, Donald Owen (III) A.B. 1957, Johns Hopkins University	D.C.		
O		S	
Oberg, Darrell Keith (II) A.B. 1958, University of Pennsylvania	N.J.	Sacks, Richard Paul (I) A.B. 1950, Bucknell University	D.C.
O'Brien, Kevin Daniel (II) A.B. 1958, Boston College	D.C.	Saunders, Barney Sutton (I) A.B. 1959, University of Colorado	D.C.
Olsen, Earl Richard (IV) B.S. 1956, University of Wisconsin	Wis.	Sawyer, Norman Marshall (IV) B.S. 1949, U. S. Coast Guard Academy	D.C.
O'Malley, Donald Francis (II) B.S. 1957, University of Pittsburgh	Pa.	Schafer, David Lloyd (IV) Schemmer, Kenneth Edwin (I) B.S. 1959, Purdue University	Minn. D.C.
O'Reilly, Richard Rolin (IV) B.S. 1957, University of Pittsburgh	Pa.	Schiffman, Elliott (IV) B.S. 1957, Yale University	Conn.
Oster, Richard E. (II) B.S. in Phar. 1950, Idaho State College	Idaho	Schlossberg, Mary Coleman (IV) A.B. 1949, University of Chicago A.M. 1957, Johns Hopkins University	D.C.
P		Schneider, Gerald Arthur (IV) B.S. 1956, College of William and Mary	N.Y.
Parker, Jerry Michael (IV) B.S. 1957, University of Pittsburgh	Pa.	Schull, Robert Scott (III) A.B. 1957, Tulane University	N.Y.
Patti, Joseph Charles (II) A.B. 1958, Rutgers University	N.J.	Secrist, Wilbur Lowell (III) A.B. 1957, West Virginia University	W.Va.
Peabody, Robert Ross (I) A.B. 1958, Stanford University	Calif.	Sedgewick, Lloyd Eugene (I) A.B. 1959, University of Virginia	Va.
Peterson, David Noel (II) B.S. 1958, Brigham Young University	Minn.	Seeley, James Albert (IV) B.S. 1957, University of Idaho	Idaho
Plater, Alfred Karl (II) A.B. 1958, Washington and Jefferson College	W.Va.	Seeman, Kenneth (II) A.B. 1958, Franklin and Marshall College	N.Y.
Pinkerton, John Douglas (IV) A.B. 1959, Rutgers University	Mich. Conn.	Senior, Robert Morris (III) A.B. 1957, Oberlin College	N.Y.
Fou, Jose Manuel (I) B.S. 1959, Catholic University of Puerto Rico	Puerto Rico	Severino, Lawrence John (II) A.B. 1958, Cornell University	N.Y.
Ponderac, Rodney Victor (I) A.B. 1959, Dartmouth College	W.Va. N.J.	Sharvelle, Derek James (I) B.S. 1959, Brigham Young University	Ind. Idaho
Purcell, Lawrence Theodore (I) A.B. 1959, Dartmouth College	N.J.	Shaw, James Thatcher (I) B.S. 1959, Brigham Young University	D.C.
Purpura, Anthony Graham (I) Putnam, Willard Samuel, Jr. (IV) A.B. 1944, Harvard University	N.Y. Mass.	Shaw, Seth Thomas, Jr. (IV) A.B. 1958, The George Washington University	
R		Sheer, Leon Gilbert (III) A.B. 1958, The George Washington University	Md.
Rabbitt, Robert W. (I) A.B. 1959, Catholic University of America	Md.	Sheffield, William Hart (III) A.B. 1957, Yale University	Calif.
Radtauer, Charles Burton (III) A.B. 1958, The George Washington University	N.Y. Puerto Rico	Sheinis, Arnold (IV) B.S. 1948, College of the City of New York	D.C.
Ramirez, Fernando Enrique (III) A.B. 1958, The George Washington University		Sheldon, Frank Chadwick (II) A.B. 1958, Rutgers University	N.J.
Raphling, David Leon (II) A.B. 1959, The George Washington University	Va.	Shepard, Dennis Dwight (I) B.S. 1959, Oregon State College	Oreg.
Reed, James Worden (I) A.B. 1957, Haverford College	Md.	Shifrin, Harris David (II) B.S. 1958, The George Washington University	D.C.
Rehmer, Richard Curtis (III) A.B. 1954, Princeton University	Pa.	Shreve, Daniel Trundel (IV) Silberman, William Charles (III) A.B. 1958, The George Washington University	Md. Md.
Reuter, Henry Clay III (I) A.B. 1954, Princeton University	D.C.	Silva, Carlos Alberto (IV) B.S. 1956, University of Puerto Rico	Puerto Rico
Richardson, Eugene Lee (I) B.S. 1959, Montana State College	Mont.	Simons, George Washington (IV) Skeen, William Waldo (IV) A.B. 1956, University of North Carolina	Md. N.C.
Ricks, David Kay (II) B.S. 1958, University of Idaho	Idaho	Skelly, Thomas Daniel, Jr. (I) Slichter, Sherrill Jeane (I) A.B. 1959, Washington State College	Pa. Wash.
Roberts, Bobbie Lee (II) B.S. 1957, University of Maryland	Md.	Smith, Mark Alexander Herbert, Jr. (I) A.B. 1959, Virginia Military Institute	Va.
Robinson, John Norton (I) A.B. 1957, University of Maryland	N.H. Utah	Smith, Joseph Eric, Jr. (IV) A.B. 1956, Washington Missionary College	Md.
Roll, William Emanuel, Jr. (IV) Rosenberg, Robert Daniel (III) Rowe, Lynn Brockbank (III) Roza, Stephen Warren (IV) A.B. 1957, Bethany College	N.Y.		

SUMMARIES OF REGISTRATION

1959-60

NUMBER OF REGISTRANTS

Class entering September 1959.....	102
Class entering September 1958.....	96
Class entering September 1957.....	96
Class entering September 1956.....	98
Total.....	392

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

Alabama	2	New York	36
Alaska	1	North Carolina	3
Arizona	6	North Dakota	1
California	43	Ohio	10
Connecticut	8	Oklahoma	1
Delaware	2	Oregon	5
District of Columbia	57	Pennsylvania	28
Florida	2	South Carolina	1
Idaho	14	Texas	1
Illinois	8	Utah	9
Indiana	6	Virginia	13
Iowa	1	Washington	6
Kentucky	1	West Virginia	12
Maryland	1	Wisconsin	4
Massachusetts	35	Wyoming	1
Michigan	6	Canada	1
Minnesota	6	Colombia	1
Missouri	4	Iran	3
Montana	4	Laos	1
Nebraska	6	Panama	2
Nevada	1	Puerto Rico	3
New Hampshire	1	Switzerland	1
New Jersey	1	Yemen	1
New Mexico	31		
	2		

GRADUATES OF COLLEGES REGISTERED IN THE SCHOOL OF MEDICINE

Albright College	1	Buffalo, University of	2
American University	1	California, University of	14
Arizona, University of	6	California, University of, at Los Angeles	3
Bates College	1	Carroll College	1
Bethany College	2	Carleton College	4
Birmingham Southern College	1	Catholic University of America	3
Boston College	1	Catholic University of Puerto Rico	1
Bowling Green State University	1	Central College	1
Brigham Young University	5	Chicago, University of	1
Brown University	1	Citadel, The	1
Bucknell University	1		

Colby College	1	Oberlin College	1
Colgate University	1	Occidental College	1
Colorado, University of	1	Ohio University	1
Columbia University	3	Oklahoma, University of	1
Cornell University	5	Oregon State College	1
Dartmouth College	6	Oregon, University of	1
Davidson College	1	Pacific, College of the	1
Dickinson College	1	Pacific Union College	1
Drake University	1	Pennsylvania, University of	1
Duke University	7	Pittsburgh, University of	1
Duquesne University	2	Pratt Institute	1
Fairmont State College	1	Princeton University	1
Fordham University	1	Puerto Rico, University of	1
Franklin and Marshall College ..	2	Puget Sound, College of	1
George Washington University, The	38	Purdue University	1
Georgetown University	4	Queens College	1
Gustavus Adolphus College	1	Reed College	1
Hamilton College	1	Richmond, University of	1
Harvard University	6	Rochester, University of	1
Haverford College	3	Rochester, University of	12
Hillsdale College	1	Rocky Mountain College	1
Hood College	1	Rutgers University	1
Idaho, College of	2	St. Olaf College	1
Idaho State College	2	San Diego State College	1
Idaho, University of	5	San Jose State College	1
Iowa, State University of	2	Scranton, University of	9
Johns Hopkins University	7	Stanford University	1
Juniata College	1	Susquehanna University	1
Kansas, University of	1	Taylor University	1
Kent State University	1	Tufts College	1
Kentucky, University of	1	Tulane University	1
Kenyon College	2	Union College	2
Lafayette College	2	U. S. Coast Guard Academy	1
LaSalle College	2	U. S. Military Academy	1
Marion College, Indiana	1	Utah State University of Agricul- ture and Applied Science	1
Marshall College	1	Utah, University of	3
Maryland, University of	5	Virginia Military Institute	1
Massachusetts College of Phar- macy	1	Virginia, University of	5
Miami, University of	2	Wagner Lutheran College	1
Michigan State University of Ag- riculture and Applied Science ..	1	Washington and Lee University ..	1
Michigan, University of	1	Washington Missionary College ..	3
Missouri, University of	1	Washington State College	1
Montana State College	1	Washington, University of	2
Moravian College	1	Wesleyan University	2
Nebraska, University of	1	Westminster College	1
New Rochelle, College of	1	West Virginia University	4
New York, College of the City of ..	1	Wheaton College	3
New York University	4	William and Mary, College of ..	3
North Carolina, University of ..	3	Williams College	4
Northern Baptist Theological Seminary	1	Wisconsin, University of	1
Northwestern University	1	Yale University	1
		Number of College Graduates Number of Colleges Repre- sented	307 125

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The George Washington University Hospital—Clinic Entrance

THE GEORGE WASHINGTON UNIVERSITY

1821

The Junior College

1930

Columbian College (the Senior College)

1821

The Graduate Council

1893

The School of Medicine

1825

The Law School

1865

The School of Engineering

1884

The School of Pharmacy

1906

The School of Education

1907

The School of Government

1928

The College of General Studies

1950

The Division of University Students

1930

The Division of Special Students

1944

The Division of Air Science

1951

The Summer Sessions

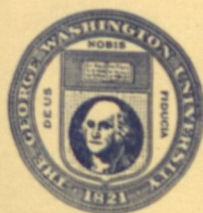
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1898

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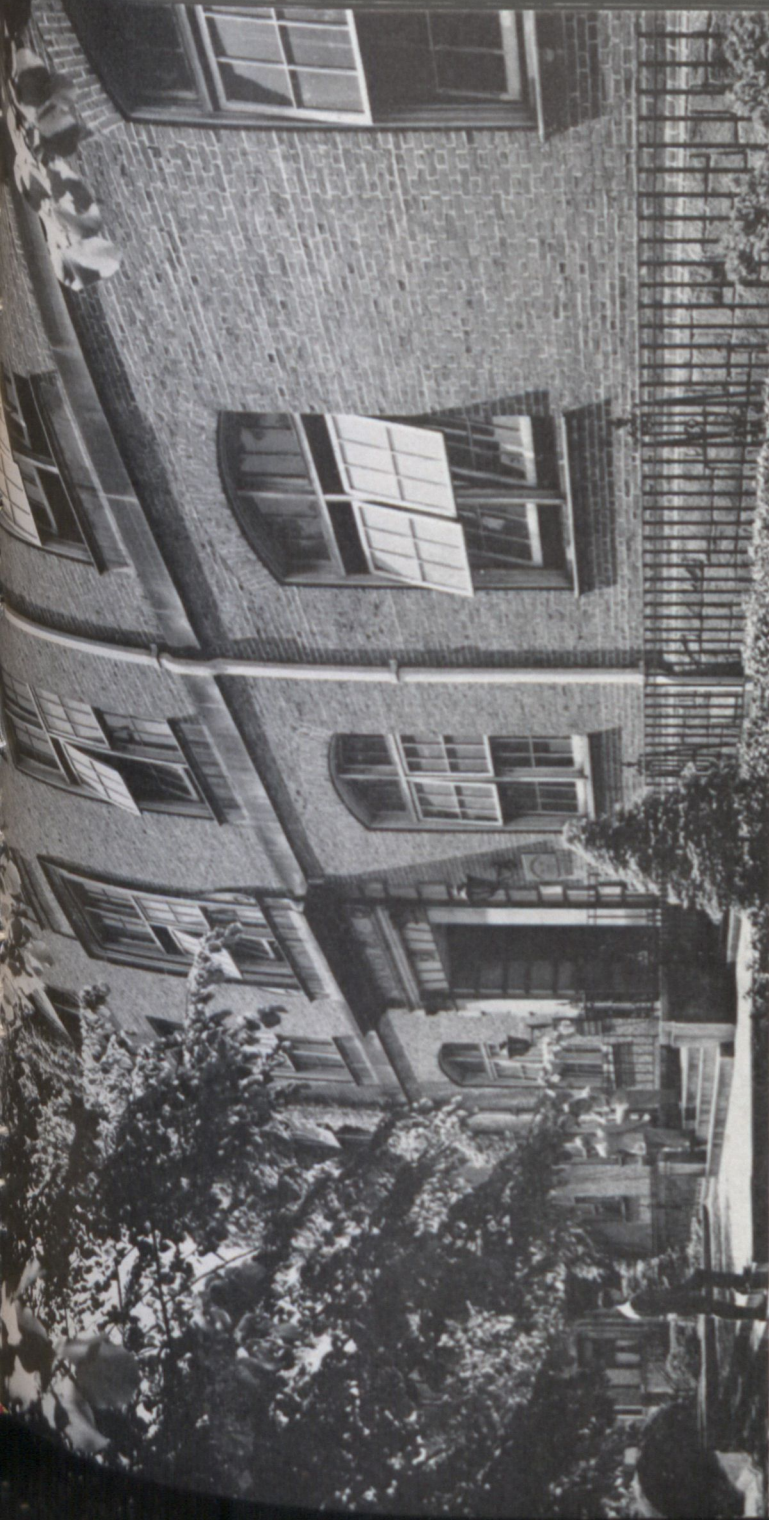
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BY THE UNIVERSITY

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CALENDAR

1960-61

Date	Day	Occasion
1960		
SUMMER TERM:		
June 6	Monday	Registration for both sessions
June 7	Tuesday	First session begins
July 4	Monday	Independence Day. Holiday
July 18	Monday	Last day of classes
July 19-21	Tuesday through Thursday	First session examination period
July 22	Friday	Registration for students attending second session only
July 25	Monday	Second session begins
Sept. 2	Friday	Last day of classes
Sept. 5	Monday	Labor Day. Holiday
Sept. 6-8	Tuesday through Thursday	Second session examination period
FALL SEMESTER:		
Sept. 22-24	Thursday through Saturday	Registration*
Sept. 26	Monday	Classes begin
Oct. 7	Friday	Last day for submitting to the Dean dissertations of candidates for the degree of Doctor of Juridical Science to be conferred in February
Oct. 22	Saturday	Fall Convocation
Oct. 31	Monday	Last day for applying in the Office of the Registrar for degrees to be conferred in February
Nov. 11	Friday	Veterans Day. Holiday
Nov. 24-26	Thursday through Saturday	Thanksgiving recess
Dec. 22-Jan. 2	Thursday through Monday	Christmas recess
1961		
Jan. 3	Tuesday	Classes resume
Jan. 20	Friday	Inauguration Day. Holiday
Jan. 21	Saturday	Last day of classes
Jan. 23-31	Monday through Tuesday	Examination period
SPRING SEMESTER:		
Feb. 2-4	Thursday through Saturday	Registration*

* Registration will be held from 10:00 AM to 8:00 PM, September 22 and 23 for the fall semester, February 2 and 3 for the spring semester; from 10:00 AM to 1:00 PM, September 24 for the fall semester, and February 4 for the spring semester.

LAW SCHOOL CALENDAR—Continued

Date	Day	Occasion
Feb. 6	Monday	Classes resume for the spring semester
Feb. 10	Friday	Last day for submitting to the Dean dissertations of candidates for the degree of Doctor of Juridical Science to be conferred in June
Feb. 22	Wednesday	Winter Convocation. Holiday
Feb. 28	Tuesday	Last day for applying in the Office of the Registrar for degrees to be conferred in June
March 1	Wednesday	Applications for scholarships for 1961-62 should be filed
March 31-April 5 .	Friday through Wednesday	Easter recess
May 1	Monday	Applications for Research Assistantships and Teaching Fellowships for 1961-62 should be filed
May 5	Friday	Last day for submitting to the Dean dissertations of candidates for the degree of Doctor of Juridical Science to be conferred in October
May 20	Saturday	Last day of classes
May 22-31	Monday through Wednesday	Spring semester examination period
May 30	Tuesday	Memorial Day. Holiday
June 4	Sunday	Baccalaureate Sermon
June 7	Wednesday	Commencement

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THE UNIVERSITY

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* For the Academic year 1959-60.
 † On leave of absence spring semester 1959-60.

THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

The George Washington University operates under a charter granted by an act of Congress of February 9, 1821, to Columbian College in the District of Columbia. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The University as it is now organized consists of the Junior College, comprising the work of the freshman and sophomore years; Columbian College, the senior college of liberal arts, which offers work leading to the Bachelor's and Master's degrees; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools, which include Medicine, Law, Engineering, Pharmacy, Education, and Government; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association.

LOCATION

The George Washington University is in downtown Washington, four blocks west of the White House and east of the Potomac River with its extensive parkway. Within a few blocks are the buildings housing the offices of many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor. Also readily accessible are the Capitol, the Library of Congress, the National Archives, the Supreme Court, and other federal courts.

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C. D. Benson (*Chairman*), M. H. Freedman, E. A. Potts

COMMITTEE ON GRADUATE STUDIES

J. F. Davison (*Chairman*), R. M. Cooper, R. G. Dixon, Jr., G. A. Ledakis, W. T. Mallison, Jr., L. S. Merrifield

COMMITTEE ON SCHOLARSHIP

O. H. Walburn (*Chairman*), C. D. Benson, R. M. Cooper

COMMITTEE ON CURRICULUM

H. I. Orentlicher (*Chairman*), W. J. Baker, W. T. Fryer, R. J. Temple, G. E. Weston

LIBRARY COMMITTEE

J. R. Hambrick (*Chairman*), J. J. McAvoy, D. B. Weaver

COMMITTEE ON STUDENT ACTIVITIES

M. H. Freedman (*Chairman*), J. J. McAvoy, H. I. Orentlicher, O. H. Walburn

* The Dean of Faculties and the Dean and Assistant Dean of the Law School are members ex officio of all committees.

GENERAL INFORMATION

LOCATION IN THE NATION'S CAPITAL

The George Washington University Law School, now in its 95th year, is the oldest law school in the District of Columbia. The School took part as a charter member in 1900 in the organization of the Association of American Law Schools and it has been an active member of the Association since that time. It is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association.

National University, which had had an important place in legal education in the District of Columbia since 1869, was merged into The George Washington University in August 1954.

Of special significance is the location of the Law School in the Nation's Capital, the focal point of the law in action, both American and international. The work of the School goes on in this environment, presenting a unique opportunity for observation and study of federal agencies—judicial, legislative, and administrative. Readily accessible are the Supreme Court of the United States, the federal trial and appellate courts of the District of Columbia, and, in addition, federal courts of special jurisdiction, such as the United States Court of Claims, the United States Court of Customs and Patent Appeals, and the Tax Court of the United States. Current federal legislation can be studied as it is considered by Congressional committees and as it comes up for debate on the floors of the House of Representatives and the Senate. It is with respect to the federal administrative agencies that the students here in Washington have matchless opportunities for study and observation. They can attend informal and formal hearings of these agencies and can obtain from the docket sections complete records of administrative adjudication in specific cases. Illustrative of such federal agencies are the Interstate Commerce Commission and the Civil Aeronautics Board in the field of transportation; the Federal Trade Commission in the field of trade regulation; the Securities and Exchange Commission in the field of security issues and corporate finance; the National Labor Relations Board in the field of labor-management relations; the United States Patent Office in the field of patent law; the Federal Power Commission in the field of water, natural gas, and electric power; and the Federal Communications Commission in the field of radio and television.

Supplementing these environmental advantages of law in action are the exceptional research library collections in the Library of Congress, in the various departments of the Federal Government, and in the libraries of the headquarters of national and international organizations located in Washington. The notable library of the Carnegie Foundation for International Peace has been acquired by The George Washington University for use of research students in international and comparative law, fields

with respect to which Washington has come to be called "The Capital of the World".

The years of residence at law school are years of participation in the life of the community, which in the case of the George Washington University Law School, is the government of the United States by law. As a consequence, the study of law takes on added meaning, whether the goal be government service or practice, general or specialized, and whatever the community in which the student plans to practice.

OBJECTIVES

The primary purpose of the Law School is to prepare men and women to meet the needs of society in the many fields of law, public and private. These needs call not only for technical skill but also for responsible leadership in the development of the law and the administration of justice. In fulfilling these responsibilities the Law School offers: (1) a program of study in preparation for the practice of law; (2) programs of study and research on the graduate level for foreign as well as for American students; (3) a continuing legal education program for members of the bar; (4) institutes and forums on current topics in domestic and foreign law; (5) the publication of a law journal containing the results of research in public law; and (6) the encouragement of student professional co-curricular activities.

PROGRAMS OF STUDY

Traditionally the Law School has been national in the geographic distribution of its students. At the present time, men and women holding baccalaureate degrees from more than three hundred colleges and universities come from the fifty states and several foreign countries to comprise the student body. As a consequence the programs of study leading to the degrees of Bachelor of Laws and Juris Doctor have been planned to provide instruction and training for the practice of law wherever the Anglo-American legal system obtains.

Graduate work leading to the degrees of Master of Laws and Doctor of Juridical Science is offered for those desiring further study and research in specialized fields of law.

Provision is made for advanced study by members of the bar who do not desire to register as candidates for degrees. Lawyers may take courses for this purpose either as unclassified graduate students or as continuing legal education students.

Graduate work is offered also to meet the needs of lawyers who come from countries whose legal systems are not based on the English law. There are two programs of study, one leading to the degree of Master of Comparative Law for lawyers planning to return to their own countries,

and the other leading to the degree of Master of Comparative Law (American Practice) for lawyers planning to remain in this country for the practice of law.

ORGANIZATION OF THE CURRICULUM

The curriculum is organized so that students may enter the Law School at the beginning of the fall or spring semester of the academic year, or at the beginning of the summer term. (For summer term information, see pages 37-38.)

MORNING AND EVENING DIVISIONS

Most morning classes meet for fifty-minute periods between 9:10 A.M. and 1:00 P.M., Monday through Friday; a few classes and Trial Practice Court meet for two-hour periods on Saturday morning.

Evening classes meet for two fifty-minute periods from 5:50 to 7:40 P.M., Monday through Friday. A four-credit course, e.g., Torts, meets two evenings a week; a two-credit course, e.g., Personal Property, meets one evening a week. The evening division conforms to the standards of the morning division, the full-time faculty participating in the instruction.

THE LIBRARY

The Law Library of 55,200 volumes contains the official reports of the decisions of the courts of last resort of all states prior to the National Reporter System, and of some states complete to date; the National Reporter System, complete; the reports of the United States Supreme Court and lower federal courts, and the reports of federal administrative agencies; Shepard's Citations for the units of the Reporter System; the English Reports, Full Reprint; the English Law Reports; the Times Law Reports; the Dominion Law Reports; the United States statutes and codes; complete sets of statutes of all the states; the English statutes; the principal English and American digests and encyclopedias; collections of special reports and annotated cases; United Nations documents; and leading textbooks and treatises. Approximately 325 legal periodicals are currently received. A section of the library, consisting of books acquired from National University, is known as the National University Law Collection.

Also available to law students are 50,000 bound volumes and 20,000 pamphlets of the former library of the Carnegie Endowment for International Peace, in the fields of international law and relations, history, and economics, in the University Library.

The Law Library, which is on the fourth floor of Stockton Hall, is open from 9:00 A.M. to 10:00 P.M., Monday through Friday; from 9:00 A.M. to 5:00 P.M. on Saturday; and from 2:00 to 6:00 P.M. on Sunday. Books and other materials do not circulate and must be used in the library.

THE LAW REVIEW

The *George Washington Law Review*, published by the University, is edited and managed by students of the Law School under the supervision of faculty advisers. It is devoted exclusively to state and federal public law. The location of the University in the National Capital, where the primary sources of federal public law may be observed in operation, affords an unexcelled opportunity for specialization in this field.

The *Review* organization includes a faculty editor-in-chief, an associate faculty editor, a faculty board of advisory editors, a board of departmental advisory editors, and a board of student editors. The student editors are chosen each year on the basis of scholarship from full-time and part-time students.

THE STUDENT BAR ASSOCIATION

Every student in the Law School is a member of the Student Bar Association, which is organized to enable students to become better acquainted with problems of the profession, to foster professional ideals, and to bring about closer contact with members of the profession engaged in active practice of the law. The work of the Student Bar Association is carried on by various committees and by group and general meetings of a professional and social nature. From time to time lectures are given by outstanding authorities on legal and professional problems.

An important activity is the Van Vleck Case Club Competition, which provides an opportunity for training in appellate advocacy. First and second year students participate as contestants before courts composed of members of the Faculty and the local bar. Senior law students of the Case Club also sit as judges. The final argument is held before a court composed of distinguished federal judges.

The Legal Aid Program is under the joint sponsorship of the George Washington University Student Bar Association and the Junior Bar Section of the District of Columbia Bar Association. Participating students assist court-appointed attorneys in the preparation of cases for trial or appeal. Qualified second- and third-year students are eligible for participation in the program.

In the ranking of member associations by the American Law Student Association, the George Washington University Student Bar Association has received first place twice and second place twice in the past five years.

ORDER OF THE COIF

The Order of the Coif, a national honor society with chapters in over forty law schools, aims "to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship."

The George Washington University Chapter was established in 1926. Members are elected each year from the highest-ranking 10 per cent of the graduating class of the Law School.

ADMISSION

APPLICATION FOR ADMISSION

The Law School, as other colleges, schools, and divisions of the University, is coeducational.

An applicant for admission must obtain from the Office of the Director of Admissions of the University an application blank which he must fill out completely and return with the application fee of \$10, for degree candidates; \$5 for nondegree candidates.

Two recent photographs must accompany the blank.

To insure prompt action, applications should be filed not later than July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions.

A legal aptitude test is required for the admission of candidates for the degree of Bachelor of Laws. Information regarding the taking of such test may be obtained from the Dean of the Law School or from the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey, which administers the Law School Admission Test at various centers of the United States four times a year. It is not necessary that formal application for admission to the Law School be made prior to taking the aptitude test.

Requirements concerning records of higher institutions previously attended are set forth on the sheet attached to the application blank.

Attendance at classes is limited to students registered for credit and continuing legal education students. "Auditing" classes is not permitted.

REQUIREMENTS FOR ADMISSION

For the Degrees of Bachelor of Laws and Juris Doctor

Bachelor of Laws.—A Bachelor of Arts or equivalent degree awarded upon completion of a four-year course in an approved college or university is required. The baccalaureate record must be of satisfactory quality and must include an acceptable distribution of courses. Eligibility is evaluated on the basis of personal and scholastic records, supplemented by the result on the legal aptitude test. An applicant will not be admitted who has been in attendance at another law school and who is ineligible to return to that school in good standing. From the applicants, a selection will be made by the Committee on Admissions.

Juris Doctor.—A student does not register as a candidate for this degree until last year in the Law School. For details, see pages 32-33.

ADVANCED STANDING

Advanced standing toward the degree of Bachelor of Laws will be granted only for work successfully completed in other law schools which are members of the Association of American Law Schools. In granting advanced standing, credits will not be recognized in excess of those which might be obtained in a similar period in this Law School.

Advanced standing will not be granted for law work already counted toward the Bachelor of Arts or other pre-legal degree.

Advanced standing will not be granted toward meeting the requirements for the degrees of *Juris Doctor* or *Master of Laws*.

For the Graduate Degrees

Candidates for graduate degrees must be accepted by the Committee on Graduate Studies.

Master of Laws.—A Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree from a member school of the Association of American Law Schools are required. Candidates for admission must have attained a *B* average on all work done for the Bachelor of Laws degree, except that, at the discretion of the Committee on Graduate Studies, applicants otherwise eligible may be admitted on proof of experience and attainment as an alternative. Advanced standing will not be granted for credits earned while a candidate for the first degree in law. Credits earned as an unclassified student will not be applicable toward meeting the requirements of the degree unless specific provision therefor is included in the letter of admission.

Master of Comparative Law and *Master of Comparative Law (American Practice)*.—The following are required: (1) the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycee, or liceo; and (2) graduation in law from a recognized foreign university where training was in Civil Law.

Doctor of Juridical Science.—The following are required: a Bachelor of Arts or equivalent degree from an approved college or university and a

* One-half of the work necessary for graduation from an approved college or university completed prior to entry into military service may be accepted as satisfying the admission requirements for pre-legal work, provided the applicant completed not less than twenty months of continuous service in the armed forces of the United States during World War II and prior to the beginning of the 1948-49 fall semester.

Bachelor of Laws or equivalent degree, earned with high rank, from a member school of the Association of American Law Schools, and outstanding capacity for scholarly work in the field of law.

Unclassified Students

A person who is in good standing as a degree candidate in another law school which is a member of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student in order to earn credits for transfer to the other law school.

A person who is a member of the bar or a person, not a member of the bar, who is a graduate of a member school of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student.

Unclassified students participate in the work of the course and take examinations. Courses taken by unclassified students will not be credited toward degrees at this Law School.

Continuing Legal Education Students

A simplified admission and registration procedure is provided for members of the bar desiring to register as continuing legal education students to take courses on a noncredit basis. Registration as a Continuing Legal Education student does not entitle the registrant to participate in the student activities or benefit from the medical privileges of the University. Members of the bar desiring to register as degree candidates or as unclassified graduate students should file the regular application for admission form.

REGISTRATION

Before attending classes each student must present himself in person for registration. No student will be registered in the Law School until proper credentials have been filed and approved (see "Admission").

Registration is held in Stockton Hall, 720 Twentieth Street, NW., during the following periods: *fall semester*, September 22 and 23, 10:00 A.M. to 8:00 P.M.; September 24, 10:00 A.M. to 1:00 P.M. *Spring semester*, February 2 and 3, 10:00 A.M. to 8:00 P.M., February 4, 10:00 A.M. to 1:00 P.M.

Registration is for the semester or session only.

A late-registration fee of \$5 will be charged each student who is permitted to register after the regular registration days.

Registration may be changed only with the permission of the Dean.

FEES AND FINANCIAL REGULATIONS

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	\$10.00
Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable	5.00
Tuition fee, for each semester hour for which the student registers	23.00
For the degree of Doctor of Juridical Science:	
For work leading to and including the final examinations	660.00
Special fee, Law School (\$1.25, Student Bar Association activities; \$1.75, <i>Law Review</i>), charged each student in the Law School for each semester or any part thereof except the summer sessions	3.00
Graduation fee	25.00
Fee for printing summary of doctoral dissertation	85.00
Fee for special examinations, for each subject	5.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program involving one course or more than one course	2.00
Residence fee,* charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements	23.00
Service fee, charged each student for late payment of tuition, see "Payment of Fees"	2.00
Reinstatement fee, charged each student who is reinstated after being suspended for delinquency in fees	5.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library facilities, except as otherwise designated; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described under "Health Administration", pages 31-32. These privileges, however, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

Subject to the approval of the Treasurer, a student may sign a contract

* Payment of the residence fee entitles the student who is granted leave of absence to return and continue his work toward a degree under the requirements which were in force at the time of his first registration but does not count as part of the residence requirement for the degree.

for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

A student who fails to meet payments when due but who pays his fees on or before the fifteenth of the month in which payment is due is charged a service fee of \$2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of \$5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

WITHDRAWALS AND REFUNDS

Application for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean. Notification to an instructor is not an acceptable notice.

In authorized withdrawals and changes in schedules, financial adjustments will be made as follows:

Fall Semester.—Withdrawal dated on or before the last working day* in October, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in November, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in November.

Spring Semester.—Withdrawal dated on or before the last working day* in February, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in March, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in March.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and the course is dropped before the regular registration day. In this case a withdrawal fee of \$5 is charged and tuition fees refunded. In no case will tuition be reduced or refunded because of nonattendance upon classes.

* The University work week is Monday through Friday, inclusive.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Withdrawal from a course or from the University between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

The grade of *F* (to be counted as zero) will be given in a course dropped without the approval of the Dean.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, LOAN FUNDS

Law School Research Assistantships.—Student research assistantships are available each year to students currently enrolled in the Law School, preference being given to applicants who are completing their second year. Each assistant receives an annual stipend. Awards are made on the basis of academic standing, financial need, and capacity for leadership. Research assistants have duties similar to those of teaching fellows. Applications should be submitted to the Dean of the Law School not later than May 1.

Law School Teaching Fellowships.—Teaching fellowships are available each year to prospective candidates for the Master of Laws degree. Each fellow receives an annual stipend, plus tuition for the academic year. Teaching fellows follow an approved program of study and research, assist members of the Faculty in the guidance of first year students, and supervise student work in legal bibliography and the drafting of legal instruments. Upon satisfactory completion of the year's work, a fellow is recommended for the degree of Master of Laws. Applications should be submitted to the Dean of the Law School not later than May 1.

Charles Worthington Dorsey Memorial Scholarship.—This scholarship, established in 1947 as a memorial to Charles Worthington Dorsey, Bachelor of Laws, '81, Master of Laws, '82, is awarded upon the recommendation of the Faculty of the Law School to a needy and promising graduate of Arts or other equivalent degree, who has maintained an average of *B* as an undergraduate student and who desires to pursue the study of law as a full-time student. The scholarship covers tuition for the course leading to the first degree from the Law School, Bachelor of Laws or Juris Doctor, provided that the holder maintains an average of *B*. The right is

* The University work week is Monday through Friday, inclusive.

reserved to suspend the benefits of the scholarship for cause at any time. The scholarship is awarded ordinarily once every three years.

Law School Scholarships.—Scholarships are available each year in the Law School to graduates of accredited colleges. Each scholarship provides full three-year tuition in the morning division of the Law School. Candidates must have graduated in the upper fifth of their class and must have demonstrated qualities of leadership in addition to scholastic attainment. To retain the scholarship, the successful candidate must maintain a *B* average. Application must be made before March 1 to the Dean of the Law School.

Phi Delta Delta Scholarship.—Zeta Chapter of Phi Delta Delta Legal Fraternity (International) offers annually a scholarship in the amount of \$40 to the woman student in the sophomore class who has excelled in scholastic achievement and service to the Law School in her first year.

Charles Glover Prize.—This prize, established in 1957 by Charles Carroll Glover, Jr., a Trustee of the University, in memory of his grandfather, Charles Glover, an illustrious member of the bar of the District of Columbia, consists of selected law books and is awarded annually to the student in the Law School who has attained the highest average grade in the third-year, full-time course.

Kappa Beta Pi Prize.—Eta Alumnae Chapter of Kappa Beta Pi Legal Sorority offers an annual prize which consists of a copy of Blackstone's *Commentaries* or a legal dictionary to be awarded to the woman law student who attained the highest average in her first year.

John Bell Larner Prize.—This prize, established by the bequest of John Bell Larner, consists of a medal which is awarded annually to that member of the graduating class in the Law School who attains the highest average grade in the entire course for the degree of Bachelor of Laws or Juris Doctor.

John Ordronaux Prizes.—These prizes were established in 1909 by the bequest of John Ordronaux.

The amount of \$70 is awarded annually to the student in the Law School who has attained the highest average grade in the first-year, full-time course; and \$70 to the student who has attained the highest average grade in the second-year, full-time course.

Through the generosity of friends of the University a number of loan funds are available to students in the Law School. Application for loans should be made to the Treasurer of the University.

REGULATIONS

Students in the Law School are subject to, and are expected to familiarize themselves with, the general University regulations stated in the University Catalogue.

AMOUNT OF WORK

Students without substantial outside employment may take a program of studies of 14 hours a week. Such students may take courses in the evening only if they are not available in the morning and if a majority of the hours taken are in morning courses. Students, whether in the morning or evening division, with substantial outside employment must take a limited program of studies not exceeding 10 hours a week. Students taking a majority of their classes in the evening may not take more than 10 hours a week. A minimum schedule of 10 hours in the morning division and 6 hours in the evening division is required except in exceptional circumstances when a reduced program is authorized by the Dean for continuing students.

ATTENDANCE

Regular attendance at classes is required and is necessary for successful work. A student who is deficient in class attendance in any course may be barred from taking the examination.

RESIDENCE REQUIREMENTS

Candidates for the degree of Bachelor of Laws must complete a residence period of three academic years. Attendance in the morning division for the fall and spring semesters constitutes residence for an academic year; similar attendance in the evening division constitutes residence for three-fourths of an academic year. Consequently, a morning student must attend 6 semesters to meet residence requirements; an evening student must attend 8. Students authorized to take schedules of less than 10 hours in the morning division or less than 6 hours in the evening division receive residence credit on a proportional basis. Students who attend the summer sessions receive fractional residence credit. For details, see page 38.

Students planning to attend summer school sessions at other law schools and desiring to use credits obtained at such schools in their course at this Law School must first have the courses they wish to take approved by the Dean. In no event will credits be recognized in excess of those which might be obtained in a similar period in this School.

GRADUATION REQUIREMENTS

Application for Graduation.—It is the student's responsibility to file an application for graduation in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Presence at Graduation.—A candidate is required to be present at the

graduation exercises unless written application for graduation in absentia is approved by the Dean.

EXAMINATIONS

Written examinations are held at the end of each course. Every student is required to take the regular examinations unless excused. No excuse for absence will be granted except by the Dean and then only for illness or other emergency. Application for excuse must be made in writing not later than one month after the date of the examination. An entry of *NG* (no grade) will be made on the record of a student thus excused. To receive credit for the course, he must take the next regularly scheduled examination.

Permission to take an examination before the regularly scheduled date will not be granted. Permission to take a postponed examination is limited to the situation provided for in the preceding paragraph.

A special examination will be granted only to a student entitled to take a postponed examination, who is a candidate for a degree to be conferred at a convocation which precedes the next regular examination in the subject. Written application, showing sufficient cause, should be addressed to the Dean, and approval will be granted at the discretion of the Faculty.

If a student fails to take an examination, a grade of *F* (to be counted as zero) will be recorded unless he has been excused from the examination as provided above or has obtained the Dean's permission to drop the course.

GRADES

Grades are indicated by the letters *A*, excellent, 85-100; *B*, good, 75-84; *C*, satisfactory, 65-74; *D*, poor, 55-64—below standard for graduation; *F*, failed—below 55; and *NG*, no grade—student excused from failure to take regularly scheduled examination. See "Examinations" above, for grade upon failure to take an examination. The grades *A*, *B*, *C*, and *D* mean that the work has been completed and credit given for the courses. *D* grades, however, do not represent satisfactory work and adversely affect a student's cumulative average. *F*, failed, means that no credit will be given.

A student may not repeat a course he has failed except by permission of the Faculty.

The cumulative average of a student includes all the grades in all the courses taken while he is in the Law School as a candidate for a particular degree. When a course is repeated, both the first grade and the subsequent grade or grades are counted in the cumulative average.

EXCLUSION AND PROBATION FOR POOR SCHOLARSHIP

Candidates for the Degrees of Bachelor of Laws and Juris Doctor.—

A student will be excluded who fails in courses aggregating 8 or more semester hours in one semester or in two successive semesters, or who fails in courses aggregating 10 or more semester hours during his period of law study. A student subject to exclusion under this provision who is currently registered will be permitted to complete the work of the semester.

A student not subject to exclusion under the foregoing rule who at any time fails to maintain a cumulative average of at least *C* will be placed on probation. A student on probation may at the discretion of the Dean be required to reduce his program of study. If a student on probation does not, by the end of the second semester following that in which his average has fallen below *C*, receive grades sufficient to give him a cumulative average of at least *C*, he will be excluded. If a student on probation attains a cumulative average of at least *C* by the grades received during the semester his status will then become clear. A maximum of three semesters of probation is allowed. Thus, if a student whose status has become clear after two semesters of probation subsequently goes on probation, he will be allowed only one semester of probation in which to raise his average to at least *C*.

In special cases in which a student who has been excluded can clearly demonstrate that his low grades were due to special circumstances beyond his control and that he has the capacity to pursue the study of law with a definite likelihood of success, such student may be readmitted by the Faculty subject to such conditions as the Faculty may impose.

Candidates for Graduate Degrees.—A candidate for one of the graduate degrees whose work is not satisfactory in the opinion of the Faculty, taking into consideration the requirements and standards for the degree, may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

Unclassified Students.—An unclassified student whose work is not satisfactory in the opinion of the Faculty may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

CLASSIFICATION OF STUDENTS

Candidates for the degree of Bachelor of Laws are divided into classes on the completion of semester hours as follows: (1) full-time students: first year, 1-28; second year, 29-56; third year, 57 or more; (2) part-time students: first year, 1-20; second year, 21-40; third year, 41-60; fourth year, 61 or more.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains four residence halls. Meals are served at the Student Union.

Admission to the University does not include room reservation. A separate application for a room should be made well in advance (for the fall semester by May 1, for the spring semester by January 1). Forms for application, together with detailed information, may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

Girls under the age of twenty-one who are enrolled for twelve or more semester hours of academic work in the University and who are not living with their parents or relatives may live outside the dormitories only with the permission and approval of the Director of Activities for Women, upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Women Students.—The Hattie M. Strong Hall provides single rooms at \$42.50 a month and double rooms at \$37.50 a month a person. The Dolly Madison Hall provides double rooms at \$37.50 a month a person.

Men Students.—Welling Hall provides double rooms at \$30 a month a person.

The John Quincy Adams Hall provides 69 double rooms, each with study alcove and bath. Rooms rent at \$40 a month a person.

PLACEMENT

The Law School takes a continuing interest in the placement of its students and graduates and maintains a limited placement service for that purpose. The Dean, the Faculty, and the University Placement Office cooperate in collecting information from alumni of the Law School, law firms, and government agencies concerning opportunities for legal positions throughout the country. Students and recent graduates are invited to discuss their placement problems.

In addition, the University Placement Office, 2114 G Street NW., provides assistance to students seeking full- and part-time employment. This office maintains a registry of positions locally and nationally available and refers qualified applicants for consideration. Information is also available on Civil Service examinations.

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M., with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) the physical examination of every student entering from secondary school; (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing in the University Hospital for not more than one week during any twelve month period—the necessity to be determined by the Director of Health Administration. All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit does not apply to illness or disability incurred previous to the University semester or prior to payment of tuition fees.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student who

has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) the above regulations apply also during the summer sessions of the University.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of physical education.

THE DEGREES OF BACHELOR OF LAWS AND JURIS DOCTOR

The programs of study leading to the degrees of Bachelor of Laws and Juris Doctor are addressed to the development and application of legal principles, skills, and ideals which are indispensable to the equipment of a lawyer for professional responsibility and leadership in modern society. They include, first and foremost, the traditional core of legal education, namely, the study of legal materials—judicial, statutory, and administrative—and instruction in the understanding and technique of their use. These programs include the study of the nature and purpose of law, the history of the Anglo-American legal system, and the history and standards of the legal profession; practice in the skills of legal research and legal writing; elementary training in trial practice; and, through the medium of seminars, experience in group handling of legal problems.

REQUIREMENTS FOR THE DEGREES

BACHELOR OF LAWS

To be recommended for the degree of Bachelor of Laws (LL.B.) the student must have completed a residence period of not less than three academic years (four years for evening students) and 80 semester hours, with a cumulative average of at least *C*. At least one academic year of residence and 28 semester hours are required of students admitted with advanced standing. Credits allowed by way of advanced standing are not included in computing the average required for graduation.

JURIS DOCTOR

The degree of Juris Doctor (J.D.) is conferred as a recognition of the completion at the George Washington University Law School, with high rank, of the required program of study for the Bachelor's degree, including experience in research and legal authorship. To be recommended

for this degree the student must have completed: (1) a residence period of not less than three academic years (four years for evening students); (2) 80 semester hours with a cumulative average of at least *B* including one of the following courses: Comparative Law I, Jurisprudence, or one of the graduate seminars; and (3) one year of acceptable service on the board of student editors of *The George Washington Law Review*, election to which is subject to regulations laid down by the Faculty. All requirements for the degree must be completed at this Law School.

HONORS

The degree of Bachelor of Laws or of Juris Doctor "with distinction" will be awarded students who obtain a cumulative average of *A*.

CURRICULUM

Required and Elective Courses.—A program of required and elective courses has been developed in order to assure coverage of the basic courses as well as to allow a degree of flexibility to meet the diverse interests of students. All first-year courses, four second-year courses, and one third-year course are required, leaving a total of 34 hours of electives. In general, second-year students are restricted to second-year electives but in appropriate cases the taking of third-year electives will be approved. Similarly, specially qualified third-year students may secure approval to take graduate courses and research in public law. It is important that students plan ahead regarding their electives.

Practice and Trial Practice Court.—Classroom instruction is conducted in pleading and procedure, trial and appellate practice, and evidence. This instruction includes grounding in the principles of the Federal Rules of Civil Procedure and the Federal Rules of Criminal Procedure. In addition, each senior student is required to participate in the work of the Trial Practice Court, which includes the trying of cases as junior counsel and as senior counsel. A special section of the court is devoted exclusively to the trial of patent cases. Experience in preparing and arguing appellate court cases is available through the Case Club Competition.

Patent Law.—Students interested in patent law should take the following group of courses: Unfair Trade Practices, Patent Law I and II, Patent Office Practice, Patent Trial Practice Court, Federal Antitrust Laws, and Trade Regulation Seminar.

Curriculum.—Following is the curriculum for students beginning in the fall semester. Adjustments are made to meet the needs of students beginning in the spring semester and in the summer.

Morning Division

FIRST YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Contracts I	4	Constitutional Law	4
Legal Method and Legal System..	4	Contracts II	2
Personal Property	2	Criminal Law and Procedure	4
Torts	4	Real Property	4
Total.....	14	Total.....	14

SECOND YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Civil Procedure	4	Administrative Law	4
Conveyances	2	Evidence	4
Electives	8	Electives	6
Total.....	14	Total.....	14

THIRD YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Trial Practice Court	2	Trial Practice Court	2
Electives	10	Electives	10
Total.....	12	Total.....	12

Evening Division

FIRST YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Contracts I	4	Contracts II	2
Legal Method and Legal System..	4	Criminal Law and Procedure.....	4
Personal Property	2	Torts	4
Total.....	10	Total.....	10

SECOND YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Civil Procedure	4	Constitutional Law	4
Real Property	4	Conveyances	2
Elective	2	Electives	4
Total.....	10	Total.....	10

THIRD YEAR

FALL SEMESTER		Semester Hours	SPRING SEMESTER		Semester Hours
Administrative Law	.....	4	Evidence	.....	4
Electives	.....	6	Electives	.....	6
Total	.....	10	Total	.....	10

FOURTH YEAR

FALL SEMESTER		Semester Hours	SPRING SEMESTER		Semester Hours
Trial Practice Court	.....	2	Trial Practice Court	.....	2
Electives	.....	8	Electives	.....	8
Total	.....	10	Total	.....	10

GRADUATE PROGRAM

DEGREES OF MASTER OF LAWS AND DOCTOR OF JURIDICAL SCIENCE

The administration of justice under law is a matter so vast and complex that some graduates feel the need for further study in order to broaden and deepen their understanding of the law. Others wish to extend their study into rapidly developing specialized fields. Graduate instruction, leading to the degree of Master of Laws, is therefore offered to enable qualified students to attain one or both of these objectives.

The degree of Doctor of Juridical Science is offered for selected students whose aim is to extend still further their studies by pursuing original research in law.

Graduate work is available to evening as well as morning students in order that lawyers in private practice and in government service may engage in advanced study or in original research.

PROGRAMS OF STUDY FOR FOREIGN LAWYERS

Two programs of study are provided to meet the needs of lawyers who come from countries whose legal systems are not based on the English law. For such lawyers, whose aim is to acquire an understanding of our system so that they may work intelligently with its materials and practitioners after returning to their own countries, there is available the degree of Master of Comparative Law. For foreign lawyers, however, who wish to practice in a common law jurisdiction there is available the degree of Master of Comparative Law (American Practice) with an appropriate and more intensive program of study. With respect to both programs, the students are not assigned to special classes but work in association with the other students in the regular courses, each student's program being adapted to his individual needs.

NONDEGREE STUDY: CONTINUING LEGAL EDUCATION

An important part of the graduate program is the offering of courses in various fields of the law for members of the bar not interested in degree candidacy but desirous of keeping abreast of current developments. The offerings in the field of governmental regulation provide opportunities for specialization. Although third-year and graduate courses are particularly suitable, first-year and second-year courses may be taken in appropriate cases. Members of the bar taking graduate work in this way register as unclassified students or as continuing legal education students.

RESEARCH IN PUBLIC LAW

Research in public law is conducted under the supervision of members of the Faculty. The purpose of this research is to furnish means for training specialists in public law, either as government lawyers or as lawyers representing individuals or corporations in cases in which the Government is a party, and to assist in the analysis, clarification, formulation, and improvement of public law, substantive and procedural.

Candidates for the graduate degrees in the Law School and specially qualified seniors may pursue this work.

REQUIREMENTS FOR THE DEGREES

MASTER OF LAWS

To be recommended for the degree of Master of Laws (LL.M.) the student must have completed a residence period of not less than two semesters. Such residence should normally be continuous. All requirements for the degree must be completed in this Law School and in a period not exceeding two years after registration for work for the degree. The student must have completed, with a minimum average of B, 20 semester hours in courses listed in the law curriculum as graduate courses except that in appropriate cases third-year courses may be approved for inclusion in the program of study if not previously taken.

MASTER OF COMPARATIVE LAW

The degree of Master of Comparative Law (M.Comp.L.) is for foreign students who intend to return to their countries. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed satisfactorily 24 semester hours in approved courses in the curriculum of the Law School or of such other departments of the University as the Faculty of the Law School shall approve.

MASTER OF COMPARATIVE LAW (AMERICAN PRACTICE)

The degree of Master of Comparative Law, American Practice (M. Comp.L.(Am.Prac.)) is for foreign students who intend to remain in this country. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed 28 semester hours in approved courses in the curriculum of the Law School with a cumulative average of at least *C*.

DOCTOR OF JURIDICAL SCIENCE

To be recommended for the degree of Doctor of Juridical Science (S.J.D.) the student must have completed a residence period of not less than one academic year. He must have pursued a course of study and research designated by his consultative committee and approved by the Committee on Graduate Studies. At the conclusion of his first year of residence, or at such other time as the Committee on Graduate Studies may set, the candidate must pass an oral examination in those fields of study selected by the consultative committee. This examination shall be conducted by the consultative committee and such other members of the Faculty and qualified experts as may be selected by the Committee on Graduate Studies.

No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary. It is the responsibility of the candidate for a Doctoral degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the dissertation, which are rigidly enforced. To be acceptable the dissertation must, in the opinion of the examining committee, constitute a substantial contribution to the field of law concerned and be suitable for publication. Additional information will be supplied by the Chairman of the Committee on Graduate Studies.

The summaries of accepted dissertations will be printed in a numbered issue of the University *BULLETIN*. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

SUMMER TERM

A term of two sessions, with morning and evening classes, is offered in the summer. Beginning students may start their studies in the first session only; continuing students and transfer students may register for either or both sessions.

The summer term is shorter than a semester of the academic year, and, as a consequence, a student must attend two and one-half summer

terms to receive residence for one academic year or attend one and one-half summer terms to receive residence for a semester.

A maximum of six semester hours may be taken each session by morning students. Such students will receive two-fifths of a semester of residence credit upon the completion of four or six semester hours in one session, and will receive four-fifths of a semester of residence credit upon completion of eight or more semester hours in two sessions. A maximum of four semester hours may be taken each session by evening students. Such students will receive three-tenths of a semester of residence credit upon the completion of four semester hours in one session, and will receive six-tenths of a semester of residence credit upon the completion of six or eight semester hours in two sessions.

Summer students planning to take the New York bar examination must register at the beginning of the term for both sessions and must complete both.

COURSES OF INSTRUCTION

COURSES OF INSTRUCTION

The courses of instruction listed below are subject to change. The University reserves the right to withdraw any course announced.

First-year courses are numbered from 100 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and graduate courses, from 401 to 500.

The number of hours of credit given for the satisfactory completion of a course is indicated in parentheses after the name of the course. Thus, a year course giving two hours of credit each semester is marked (2-2), and a semester course giving two hours of credit is marked (2).

Morning classes begin at 9:10 A.M. Evening classes begin at 5:50 P.M.

FIRST YEAR

100 Agency (2)

Cooper, Mullin

Fall—morning and evening; summer 1960. Master and servant (status of agent), respondeat superior, nature of agency relation, actual authority, parties (disclosed and undisclosed principal), unauthorized transactions, notice, notification.

110 Constitutional Law (4)

Dixon

Spring—morning and evening. Basic principles of American constitutionalism; judicial function in constitutional cases; implementation of doctrines of separation of powers, federalism, limited government; development and exercise of national powers; introduction to civil rights and liberties.

115-16 Contracts I-II (4-2)

Mayo, Freedman, Allen, Shelhorse

Academic year—morning and evening; summer 1960. Legal remedies of contracting parties, including damages in contract and quasi-contract, specific performance, reformation, rescission, and remedies in tort; acts creating and terminating contractual rights, including offer and acceptance, mistake, and problems of proof; the function of consideration; third party beneficiaries; assignments; the effect of changed circumstances.

125 Criminal Law and Procedure (4)

Cooper, Baker, L'Hommedieu

Spring—morning and evening. Origin and purposes of criminal law; elements of criminal liability; mental disorders; solicitation, attempt, and conspiracy; crimes against the person, against property, and against both; statutory offenses; criminal procedure, with consideration of Federal Rules of Criminal Procedure.

135 Legal Method and Legal System (4)

Fryer, Benson, Orentlicher, Merrifield, Goldsborough, Evans

Fall—morning and evening; spring—morning and evening; summer 1960. Introduction to substantive and procedural law dealing with basic concepts;

training in method and technique of case law and legislation using modern case records; practice in use of law books and in legal writing; importance of language in law; legal reasoning and use of precedents under doctrines of stare decisis, law of the case, and res judicata; development of Anglo-American legal system; organization of judiciary and bar, stressing enforcement of ethical standards.

- 145 *Personal Property* (2) Fryer, Dixon, Mallison, McAvoy, Nash
Fall—morning and evening; spring—evening; summer 1960. Concepts of property, including interests created by bailments, liens, and pledges; methods of acquiring ownership.

- 150 *Real Property* (4) Benson, Walburn, Ledakis, Baker
Fall—evening; spring—morning; summer 1960. Historical background of the law of estates and conveyancing; types of estates; dower and curtesy; landlord and tenant relationship; concurrent estates; future interests at common law and after the Statute of Uses; the Rule against Perpetuities; incidents of divided ownership, as waste; natural rights; zoning and other land controls.

- 160 *Torts* (4) Merrifield, Walburn, Temple
Fall—morning; spring—morning and evening; summer 1960. Liability for harm to persons or tangible things; defamation and invasion of privacy.

SECOND YEAR

- 202 *Administrative Law* (4) Davison
Fall—evening; spring—morning; summer 1960. The position of the administrative process in the separation of powers, including the status of administrative personnel, administrative hearings, judicial scrutiny of administrative action, discretion, and rule-making—particularly as relating to federal administrative agencies.

- 205 *Brief Writing and Oral Argument* (2)
Not offered 1960-61. Exposition and study of the basic techniques of written and oral legal argumentation. Each student will be required to write, as a term paper, a brief presenting contentions based on the actual record in an unargued case.

- 210 *Business Associations* (4) Weaver, McAvoy
Spring—morning and evening. Contrast of the partnership and corporation as alternative forms of organization; organizing partnerships and corporations—formalities, capital contributions, share structure; problems of operation; relations between partners; roles of shareholders, directors, officers; control devices; distributions to owners; voluntary reorganization; dissolution and termination.

- 215 *Civil Procedure* (4) Walburn, Temple, Thaler
Fall—morning and evening; summer 1960. Pleadings, discovery, joinder, forms of trial and related proof problems. Emphasis is on Federal Rules of Civil Procedure and other modern codes.

- 219 *Commercial Paper* (4) Orentlicher, Ledakis
Fall—morning and evening; summer 1960. Bills of exchange, promissory notes and checks, especially under the Negotiable Instruments Law.
- 224 *Commercial Transactions* (4) Ledakis
Spring—morning and evening. The law relating to the sale and distribution of goods, and to the security financing devices utilized in this connection, with particular attention to the effect of uniform laws.
- 230 *Conveyances* (2) Benson, Walburn, Baker
Fall—morning and evening; spring—evening; summer 1960. Conveyances, recording; easements, profits, covenants, and equitable servitudes; adverse possession and adverse user.
- 235 *Domestic Relations* (2) Potts, Williams
Fall—morning and evening; summer 1960. Marriage, annulment, and divorce; adoption and custody of children; economic relations.
- 240 *Evidence* (4) Fryer, Weston
Spring—morning and evening; summer 1960. Functions of court and jury; qualifications and examination of witnesses; opinion, relevancy, and scientific evidence; proof of writing; application of the hearsay rule.
- 243 *Federal Jurisdiction* (2) Cooper
Fall—morning and evening. Constitutional and statutory origins of federal courts, cases arising under the laws and the Constitution, diversity of citizenship, jurisdictional amount, removal procedure and jurisdiction, limitations on federal jurisdiction, state and federal conflicts, substantive law applied by federal courts.
- 251 *Insurance* (2) Czyzak
Fall—evening; summer 1960. The insurance device in life, property, and other risks.
- 254 *International Law and World Order* (4) Mallison
Fall—morning and evening. Traditional content of course in international law presented in context of values and institutions of the world community; formal prescription and effective practice concerning participants in decision-making processes; roles of individuals, international public organizations, political parties, pressure groups, private associations, and national states.
- 259 *Labor Law* (4) Merrifield
Spring—morning and evening. Law governing labor-management relations, organization and representation of employees, regulation of economic weapons, enforcement of collective bargaining agreements, interunion and intraunion relations.
- 265 *Law and Accounting* (2) Hambrick, S. Cohen
Fall—morning; spring—evening; summer 1960. Introduction to elementary techniques and principles of financial accounting, relevance of accounting judgments to legal problems, legal judgments involved in problems affected by accounting principles and practice.

270 *Legislation* (2)

Fryer, Mallison

Spring—morning and evening; summer 1960. The legislative process and roles of various participants in the process; operation of the United States Congress and state legislatures, including fact finding, organization, and procedure; problems of statutory interpretation.

274 *Taxation—Federal Estate and Gift* (2)

Hambrick

Fall—morning and evening. A survey of the substantive provisions of the federal estate and gift tax laws, including inter vivos transfers, transfers in contemplation of death, joint interests, life insurance proceeds, property subject to powers of appointment, the marital deduction and split gifts; tax procedure.

279 *Taxation—Federal Income* (4)

Hambrick, Weaver

Spring—morning and evening; summer 1960. Survey of substantive provisions of federal income tax, including concept of gross income, limitations on allowable deductions, problems of capital gains taxation, nontaxable exchanges of property, basis problems, provisions affecting the taxation of the family, and principles of income tax accounting.

285 *Trusts and Estates* (4)

Weaver, McAvoy

Fall—morning and evening; summer 1960. Formalities of execution of wills; problems of construction, revocation, contest; limits on testamentary power; intestate succession. Creation of trusts, inter vivos and testamentary; administration of decedents' estates and trust estates.

295 *Unfair Trade Practices* (4)

Weston

Fall—morning and evening. Unfair trade practices at common law and under statutes; trade-marks, trade names; copyright law; misappropriation of ideas; protection of competitors and consumers against false advertising under Federal Trade Commission Act; resale price maintenance under state Fair Trade Acts; miscellaneous business practices.

THIRD YEAR

302 *Admiralty* (2)

Davis

Spring—evening. Federal and state jurisdiction; jurisdiction over waters, craft, contracts, torts, crimes, in equitable matters, etc.; laws applicable to maritime workers and maritime liens.

307-8 *Comparative Law I-II* (2-2)

Davison

First half: fall—morning and evening. Second half: spring—evening. The Civil Law System; general introduction to foreign law as exemplified by Roman Law and the French and German Civil Codes; comparative study of administration of justice and legal institutions. *Comparative Law I* may be taken independently of *Comparative Law II*.

309 *Conflict of Laws* (4)

Dixon

Fall—morning and evening; summer 1960. Legal problems arising from occurrences transcending state or national boundaries; jurisdiction; foreign judgments; constitutional influences; theoretical bases of choice of law principles and their application to specific fields, including torts, contracts, property, family law, administration of estates, and business associations.

313 *Constitutional Interpretations* (2)

Dixon

Not offered 1960-61. Advanced course in constitutional law. The Constitution and constitutional tradition, process of judicial decision-making, significance of "due process", current constitutional developments, adequacy of the traditional system of powers and limitations, introduction to comparative constitutional law.

318 *Creditors' Rights* (4)

Summer 1960. Remedies of unsecured creditors; judgments, fraudulent conveyances, creditors' agreements, equity and statutory receiverships, and bankruptcy. The general approach is that of law administration.

321-22 *Current Decisions* (2-2)

Weston, Freedman

Academic year—morning and evening. Required of, and limited to, members of the student staff of the *Law Review*.

330 *Federal Antitrust Laws* (4)

Weston

Spring—evening. Restraints of trade at common law and under Sherman Antitrust Act of 1890, Federal Trade Commission and Clayton Acts by mergers, monopolies, price-fixing agreements, trade associations, exclusive-dealing agreements, tie-in sales, and trade boycotts; patents and copyrights under antitrust laws.

335 *Jurisprudence* (2)

Mayo

Fall—evening; spring—morning. History of jurisprudence; schools of jurists, particularly the nineteenth century schools; sociological jurisprudence; theories of justice; the nature of law; law and morals; law and the state; the scope and subject matter of law; sources and forms of law; the traditional element; analysis of general legal concepts.

339 *Collective Bargaining and Labor Arbitration* (2)

Merrifield

Fall—evening. The collective labor agreement: its content, negotiation, and administration through the grievance procedure and arbitration; problems in the settlement of labor disputes.

341 *Labor Standards and Social Security Legislation* (2)

Merrifield

Not offered 1960-61. Legal problems arising under federal and state statutes dealing with labor standards and social security. Particular emphasis is placed upon the regulation of wages and hours, workmen's compensation, and insurance against unemployment and old age.

345 *Legislative Drafting* (2)

Zinn

Fall—evening. Advanced instruction and practice in legislative drafting.

349 *Local Government Law* (2)

Mallison

Spring—evening. The decision-making processes in metropolitan and local communities; types and objectives of city, county, and special function local government units; intergovernmental relations; original organization and changes; local lawmaking; community planning and development.

355 *Mortgages* (2)

Summer 1960. Security interests in real property, their creation, transfer, enforcement, and extinguishment. Orentlicher

359 *Patent Law I** (2)

Fall—evening. Origin and nature of patents, patentable subject matter, classes of patents, novelty, utility, invention, patent claims and their interpretation, acts constituting infringement, correction of patents. O'Connell

360 *Patent Law II* (2)

Spring—evening. Lectures and discussion; licensing and protection of industrial property; uses and abuses of patents; governmental regulation; protection abroad; economic and social functions of patents, trade-marks, and copyrights. Harris

362 *Patent Office Practice** (2)

Spring—evening. Rules and practice; appeal and interference procedure. Rose

365-66 *Patent Trial Practice Court** (2-2)

Academic year—evening. Practice before the United States Court of Customs and Patent Appeals and the federal courts. Prerequisite: forty-two semester hours, including Law 215 and 240. Law 359, which is also required, may be taken concurrently. Brown, Federico

This course may be elected instead of Law 385-86 to satisfy the Trial Practice Court requirement.

370 *Public Utilities* (2)

Fall—evening. Regulation by federal, state, and municipal authorities concerned with licensing, rates, services, and practices, with emphasis on federal regulation of interstate operations; judicial review. Fryer

376 *Restitution* (2)

Spring—morning and evening; summer 1960. Remedies at law and in equity for restitution of benefits conferred, especially as based on the concept of unjust enrichment. Orentlicher

380 *Suretyship* (2)

Summer 1960. The law of suretyship, especially in the context of accommodation credit and commercial and financial practices, with attention also to informal and nonconsensual suretyship relations and the place of suretyship principles in the solution of legal problems generally. Orentlicher

385-86 *Trial Practice Court* (2-2)

Academic year—morning and evening. Trial of assigned cases; trial tactics and techniques; pre-trial and court room procedures pursuant to Federal Rules. To be taken in the senior year. Prerequisite: forty-two semester hours, including Law 215 and 240. Jackson, Myers, Edgerton, Herrick, Monk, Walsh, Beard, Kendrick, Skinker

* Patent law students may take Law 359 and Law 365 concurrently in the fall semester and Law 362 and Law 366 concurrently in the spring semester.

- 391 *United Nations Constitutional Law* (2) Mallison
 Spring—evening. Structure and process of decision of the United Nations—the peaceful settlement of disputes, collective security, regulation of armaments, regional arrangements, and types of functional cooperation.

GRADUATE COURSES

- 401 *Administrative Law Seminar* (2) Davison
 Spring—evening. Group study of specific problems in administrative law.
- 408 *Constitutional Law Seminar* (2) Dixon
 Spring—morning. Group study of contemporary problems in constitutional law.
- 412 *Control and Use of Atomic Energy* (2) Mayo
 Spring—evening. Various legal problems involved in the control and use of atomic energy will be examined, including the Atomic Energy Act, the policy underlying the present government monopoly, the security problem of safeguarding atomic military information, the implications in prospective industrial control and use, and legal means of protecting personal interests against the possible consequences of atomic warfare.
- 416 *Criminal Practice and Administration* (2) Cooper
 Spring—as arranged. Group study of the fundamental aspects of criminal procedure with special reference to practice before the District of Columbia and federal courts; the law of arrest, searches and seizures, self-incrimination, the function of the preliminary examination and grand jury, sufficiency of indictments, trial procedure, and the order of pleas and motions. Advance registration, limited to fifteen students.
- 420 *Estate Planning Seminar* (2) Weaver
 Spring—evening. Group study of the effective disposition of wealth, inter vivos and testamentary gifts, conservation for owner's future use, use of insurance, tax and administrative problems, business interests, pension and profit-sharing arrangements.
- 424 *Evidence and Trials Seminar* (2) Fryer
 Fall—evening. Study of selected problems involving presentation of documentary proof and expert testimony in connection with the reforms sought by the Uniform Rules of Evidence and recent developments in the field of forensic medicine.
- 428 *Food and Drug Law* (2) Goodrich, Kleinfeld
 Spring—evening. A lecture and discussion course dealing with the Federal Food, Drug, and Cosmetic Act and governmental controls thereunder. Both government and industry viewpoints are considered.
- 431 *Government Contracts I* (2) McIntire
 Fall—evening. A consideration of the basic power of the Federal Government to enter into contracts; the nature and construction of such contracts; normal

and war or defense powers aspects of government procurement, including administrative and legislative policy and procedures; forms of contracts; standard clauses; advertised bid procedure problems; negotiated contracts; modification of contracts; remedies on contractual claims.

432 *Government Contracts II* (2)

McIntire

Spring—evening. Special problems in government contracts, including adjustments and relief; procedure for prosecuting claims under government contracts; attempts at price, cost, or profit control; termination. Prerequisite: Law 431.

442 *Labor Law Seminar* (2)

Merrifield

Fall—evening. Group study of contemporary problems in labor law.

449 *Law of the Near East* (2)

Liebesny

Not offered 1960-61. A study of the law of the Arab countries, including the basic principles of the Islamic law, an analysis of the present day codes, and an investigation of the Western influences on the laws of the Arab countries.

455 *Legal Problems in Modern Methods of Warfare* (2)

Mallison

Not offered 1960-61. The contemporary international law of war: legal aspects of modern methods of coercion (economic, political, psychological, and military); regulation of hostilities; the special problems of atomic, biological, and chemical weapons; war crimes.

459 *Military Law and Jurisdiction* (2)

Not offered 1960-61. Sources of military jurisdiction; military law proper, including court-martial jurisdiction and procedures before, during, and after trial; military government; martial law; laws of war and treatment of offenders.

463 *Regulation of Communication Media* (2)

Mayo

Fall—evening. An examination of the legal doctrine relating to regulatory practices in the channels of mass communications, i.e., newspapers, motion pictures, and radio-television; analysis of the operational structure of the mass media and the pattern of control exercised by government, private associations, and various community groups; appraisal of the comparative utility of various regulatory techniques for implementing policies affecting these media; special emphasis will be placed on the functions of the Federal Communications Commission.

466 *Regulation of Securities and Securities Markets* (2)

M. Cohen

Fall—evening. A study of state and federal laws governing the offering and distribution of securities to the public by corporate issuers and others, the regulation of securities markets, and the rights and liabilities of purchasers under such statutes. Particular emphasis will be given to statutes administered by the Securities and Exchange Commission.

469 *Research in Patent, Trade-Mark, and Copyright Law* (2)

Harris

Fall—as arranged; spring—as arranged. Registration limited to students with at least a B average who have taken Patent Law I and II and related

courses including, as a rule, Trade Regulation Seminar. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

471 *Research in Public Law* (2)

The Staff

Fall—as arranged; spring—as arranged. Registration limited to students with at least a *B* average who have had a seminar or comparable course in field of proposed research. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

475 *Taxation—Corporate* (2)

Hambrick

Fall—evening. Analytical study of income tax problems in corporate dividends and distributions in redemption of stock; corporate liquidations; reorganizations, mergers, and acquisitions; recapitalizations; organization and sales of corporate businesses; collapsible corporations; carryovers. Prerequisite: Law 279.

480 *Taxation—Oil and Gas* (2)

Hambrick

Spring—evening. A study of the case law relating to percentage depletion, sales and transfers of interests in oil and gas properties; legal aspects of financing methods in oil and gas operations; application of partnership and corporation provisions of the 1954 Internal Revenue Code to oil and gas activities. Prerequisite: Law 279.

485 *Taxation Seminar* (2)

Hambrick

Spring—evening. Selected problems in federal income, estate and gift taxation, involving factual analysis and legal research, and the preparation of memoranda of law, legislative drafting or other appropriate disposition. Identical problems or cases will be assigned to small groups for development and disposition. Registration subject to approval of teacher. Prerequisite: Law 274 and 279.

492 *Trade Regulation Seminar* (2)

Weston

Spring—evening. Group study of current problems relating to unfair trade practices and federal antitrust laws.

495 *Urban Redevelopment* (2)

Orentlicher

Fall—evening. Selected problems in urban redevelopment and housing, with particular emphasis on programs under current federal and state legislation.

DEGREES CONFERRED

BACHELOR OF LAWS

FEBRUARY 23, 1959

Tyler Abell	Va.	Phillip Spayde Oberlin	Va.
A.B. 1954, Amherst College		B.S. in Met. Eng. 1955, Purdue	
Wendell Peyton Ables	D.C.	University	
B.S. 1954, University of Utah		Owen Errett Perry	
Warren James Adair, Jr.	Pa.	B.C.E. 1953, Georgia Institute of	
A.B. 1953, University of Pennsylvania		Technology	
Thomas Allen Briody	Va.	Robert Jay Platt	
B.E.E. 1952, Villanova University		B.S. 1916, College of the City of	
William Goodman Campbell	Idaho	New York	
B.S. 1956, University of Nebraska		A.M. 1938, Columbia University	
William Yates Farnsworth, Jr.	Va.	Marvin Hersh Rosen	
A.B. 1953, Brigham Young University		B.S. 1951, Pennsylvania State Teachers	
Elvir Anthony Fay	Texas	College, Kutztown	
A.B. 1956, Texas Western College		Sam Rosen	
John Stirling Fessenden	Maine	B.S. in Phar. 1950, The George	
(With distinction)		Washington University	
A.B. 1952, Dartmouth College		Hyman Louis Rosenberg	
Allan Bernard Foy	D.C.	A.B. in Govt. 1956, The George	
A.B. 1951, University of Maryland		Washington University	
Marc Stuart Gross	N.Y.	Morris Rozar	
B.S. in Ch.E. 1955, Massachusetts		A.B. 1956, Wake Forest College	
Institute of Technology		Frederick Joseph Schmitt III	
Richard Wayman Hanes	Va.	A.B. 1953, Gettysburg College	
B.S. in E.E. 1953, Purdue University		Philip Schwartz	
Howard Richard Haronian	R.I.	A.B. in Govt. 1952, The George	
B.S. 1955, University of Rhode Island		Washington University	
Lawrence Darrow Huntsman	Va.	Maurice Alan Sovern	
B.S. 1956, Pennsylvania State University		B.S. 1951, Purdue University	
Daniel Lyon Kahn	Fla.	Marion Cole Staves	
A.B. 1954, University of Miami		B.S. 1952, American University	
Thomas John Kane	N.Y.	M.S. 1954, Georgetown University	
A.B. 1949, Cornell University		Frederick Clyde Timberlake	
John Davidson Kelly	Mont.	B.B.A. 1951, Westminster College	
A.B. 1953, Carroll College		M.B.A. 1954, Ohio State University	
Burton Ernest Levin	N.Y.	Dale Owen Torrence	
A.B. 1949, Duke University		A.B. 1956, University of North Carolina	
John Frederick Livingston, Jr.	Ark.	William Francis Upshaw	
B.S. in B.A. 1955, University of Arkansas		B.S. 1951, M.S. 1953, Florida State	
Carl Vernon Lyon	Va.	University	
A.B. 1949, West Virginia Wesleyan		Manley Burt Wade	
College		A.B. 1953, Pacific Union College	
A.M. 1951, American University		Harold Webb	
Henry Francis Beaumont Martin	D.C.	B.S. 1953, University of Alabama	
A.B. 1956, The George Washington		Paul Harold Weinstein	
University		B.S. 1955, Washington and Lee	
Malcolm Theodore McDonald	Va.	University	
A.B. 1952, University of North Carolina		William Jacob Wilken	
Rankin Allen Milliken	Va.	A.B. 1949, State University of Iowa	
B.S. in E.E. 1950, Northeastern		Morris Wiseman	
University		B.S. in Ch.E. 1955, Drexel Institute	
Richard Linn Morgan	W.Va.	of Technology	
B.S. in Ed. 1952, West Virginia		Franklin David Wolfe	
University		B.S. in Ch.E. 1954, University of	
L. Dow Nichol III	Ill.	Maryland	
B.S. in C.E. 1953, University of Illinois			

JUNE 3, 1959

Reginald Lee Ayers	Va.	Alban Emerson Brooke	
B.S. 1952, Bowling Green College of		A.B. 1953, The Citadel	
Commerce		John Henry Byrd, Jr.	
Thomas Ray Boston	Va.	B.S. 1952, U. S. Coast Guard Academy	
B.S. 1956, University of Kansas			

Jay Morton Cantor B.S. in E.E. 1956, A.B. 1957, University of Pennsylvania	Pa.	Richard Guy Lione B.S. 1954, University of Wisconsin	Wis.
Helen Ann Carney B.S. 1953, Syracuse University	N.Y.	Robert Eugene Long A.B. 1953, Indiana University	Ind.
William Otis Carpenter A.B. 1950, The George Washington University	Va.	Frank May Mahon B.S. 1952, M.S. 1955, North Texas State College	Texas
George Herman Childress B.S. 1952, Oklahoma State University	Okla.	Leo Italo MaLossi B.C.E. 1947, Rensselaer Polytechnic Institute	N.Y.
James Ernest Cornbrooks B.S. 1950, Florida State University	D.C.	Charles Austin Marlow, Jr. A.B. 1953, The George Washington University	Va.
Edward Kent Daniels, Jr. B.S. in M.E. 1955, West Virginia University	Va.	Donn Richard Marston A.B. 1956, Harvard University	N.Y.
Donald de Laski A.B. 1954, Duke University	Va.	Douglas Robert McKechnie B.M.E. 1953, Rensselaer Polytechnic Institute	N.Y.
Frederick Joe Deuber B.S. 1953, Ohio State University	Ohio	James Joseph McKeever B.S. 1950, Fordham University	N.Y.
Howard Donald Doescher B.S. in Ch.E. 1948, University of Denver	Okla.	Milton Samuel Mehr B.C.E. 1951, Rensselaer Polytechnic Institute	D.C.
Olvin Samuel Elson A.B. 1956, The George Washington University	Va.	Alex Mich, Jr. B.S. in Ch.E., Met.E. 1949, University of Michigan	Mich.
Otto Evans Eskin A.B. 1956, Bowdoin College	D.C.	Patrick James Moriarty A.B. 1950, American International College	Va.
George Herbert Fahy A.B. 1954, The George Washington University	D.C.	A.M. 1951, University of Minnesota	Mass.
Ralph Henry Feddersen A.B. 1940, The George Washington University	Va.	James Elzar Nathanson A.B. 1954, Harvard University	Mass.
John Arthur Fridolin Feldmann B.S. 1954, Harvard University	Conn.	William Albert Neal A.B. 1956, University of Maryland	Md.
Daniel Tobias Franklin A.B. 1956, The George Washington University	D.C.	Edmond John Newbould B.S. 1940, U. S. Naval Academy	N.Y.
James Alan Geppert B.S. in Ch.E. 1955, Northwestern University	Ill.	Thomas Burrett Oakes A.B. 1956, Yale University	Va.
Everett Grant Germain, Jr. B.S. in E.E. 1953, Virginia Polytechnic Institute	Va.	James David O'Brien B.S. in F.S. 1953, Georgetown University	Mass.
Benjamin Franklin Griffin B.E.E. 1951, University of Virginia	Va.	Arthur Irving Palmer, Jr. B.E. 1949, Yale University	Va.
Lowell Lock Heinke B.S. in Eng. 1954, Case Institute of Technology	Va.	M.A.M. 1956, University of Virginia	Va.
Thomas Oliver Herbert B.E.E. 1953, Catholic University of America	Va.	Thomas Madison Phillips B.E.E. 1952, Georgia Institute of Technology	Va.
Robert Richard Herz B.S. 1951, Columbia University	Nev.	Reginald Harrison Pledger, Jr. A.B. 1955, Duke University	Okla.
Wayne Dean Hill B.S. 1955, Ohio State University	Va.	Nancy Pyeatt B.S. 1950, St. Mary College, Kansas	Ky.
Robert Farnham Howson A.B. 1954, University of Massachusetts	N.Y.	John Ferguson Rodgers A.B. 1956, University of Louisville	La.
Francis Masayuki Isumi A.B. 1954, University of Hawaii	Hawaii	Shep Kalman Rose B.S. in Phar. 1955, University of Georgia	Md.
Topson Davis Jennings IV B.S. in E.E. 1954, University of Miami	Fla.	Douglas Joseph Rykhus A.B. in Govt. 1951, The George Washington University	D.C.
David William Johnson B.S. 1952, Brooklyn College	N.Y.	Donald Jack Salins B.S. 1954, D.C. Teachers College	D.C.
Ernest Vernel Judd B.S. 1956, Brigham Young University	Utah	Kenneth John Scott A.B. 1951, Harvard University	Pa.
Delmer Kalrich, Jr. A.B. in Govt. 1955, The George Washington University	Va.	Paul Peter Senio B.S. 1954, Carnegie Institute of Technology	D.C.
Belle Lewis Kuch B.S. 1953, Brooklyn Polytechnic Institute	N.Y.	Ivan Jay Shefferman B.S. 1954, University of Maryland	Md.
Edward Wayne LeBaron, Jr. A.B. 1950, College of the Pacific	Calif.	Julian Lee Siegel B.S. 1954, The George Washington University	

Nicholas Skovran	Va.	Sylvia Carol Troy	Va.
B.S. 1950, M.S. 1952, Pennsylvania State University		A.B. 1956, University of Michigan	Md.
John Gordon Smith	N.Y.	Jack Rush Turney	N.Y.
B.S. 1955, Columbia University		A.B. 1956, Western Maryland College	
John Luis Sniado	Mass.	James Victor Villarejo	D.C.
B.S. in Ch.E. 1953, University of Massachusetts		A.B. 1939, University of Wisconsin	
Edwin Wallace Snider	Va.	James Aubrey Wong	Fla.
A.B. 1947, Princeton University		B.M.E. 1951, The George Washington University	
George Roderick Snyder	Pa.	Quillian S. Yancey	N.Y.
A.B. 1954, Pennsylvania State University		B.S. 1949, Florida Southern College	
Paul Gordon Stafford	Md.	Murray Zweben	
A.B. 1956, University of Maryland		B.S. 1952, M.S. 1953, New York State Teachers College, Albany	

OCTOBER 17, 1959

William McCormick Brown	Md.	Lorenzo Blaine Liljenquist	Va.
A.B. 1956, Duke University		B.S. 1938, University of Idaho	N.Y.
Joseph Jay Bullock	Utah	Philip George Luckhardt	Vt.
B.S. 1954, Brigham Young University		B.S. 1956, Columbia University	
Charles Augustine Caffrey	Va.	Stephen Briggs Martin	D.C.
A.B. 1952, Wilkes College		A.B. 1954, Wesleyan University	
Thomas Kohler Cassidy II	Wyo.	Edgar Burton May	D.C.
B.S. 1953, University of Wyoming		A.B. 1952, A.M. 1953, University of Buffalo	
Gay Chin	Va.	Harrison Eugene McCandlish	N.C.
B.S. in M.E. 1946, Oregon State College		B.M.E. 1952, Polytechnic Institute of Brooklyn	
Noel Samuel Clifton	Va.	Gibbon Elliott McNeely	Mass.
B.S. 1952, University of Virginia		B.S. 1950, University of North Carolina	
Joseph Allen Cook	Md.	Paul Maurice Moriarty	Md.
A.B. 1953, University of Maryland		A.B. 1942, Columbia University	
Teviah E. Drucker	S.C.	Armand Girard Morin	Md.
B.S. 1956, University of South Carolina		B.S. 1939, University of New Hampshire	
Howard Lee Edwards	Utah	John Faris Myers	Va.
B.S. 1955, Brigham Young University		B.S. 1954, University of Maryland	
Gary Dee Fields	Ill.	Donald Steen Olexa	Md.
B.S. 1956, Iowa State College of Agriculture and Mechanic Arts		B.S. 1956, Pennsylvania State University	
Julius Paul Filcik	Va.	Robert Kessler Painter	Va.
B.S. in Ed. 1953, Pennsylvania State Teachers College, Indiana		B.S. 1953, University of Illinois	
Philip Benjamin Fischer	N.Y.	Walter Eugene Pavlick	Va.
A.B. 1956, Adelphi College		B.S. in C.E. 1956, Case Institute of Technology	
William Wendell Garretson	Iowa	Stanley Durward Perry	D.C.
A.B. 1956, Iowa Wesleyan College		A.B. 1955, The George Washington University	
Marion Sherman Gill	Ark.	William Dial Perry	Va.
B.S. 1954, Arkansas Agricultural and Mechanical College		A.B. 1953, Princeton University	
Reina Alice Grant	Md.	Robert Allen Petrusek	Md.
A.B. 1956, The George Washington University		B.S. 1954, University of Wisconsin	
James Thomas Greenwood	Va.	Richard McFarland Pfeiffer	Ark.
B.S. 1954, Pennsylvania State University		A.B. 1949, University of Pittsburgh	
Henry Hansen	Va.	Joe Weldon Phillips	Md.
B.S. in M.E. 1951, Drexel Institute of Technology		B.S. 1956, Arkansas State Teachers College	
Eugene Loyce Holder	Calif.	Kenneth Elmer Pruden	N.Y.
A.B. 1953, University of California at Los Angeles		B.S. 1951, U. S. Naval Academy	
A.M. in Govt. 1956, The George Washington University		Gerald Francis Richards, Jr.	D.C.
Curtis Arthur Jennings	Ariz.	B.B.A. 1956, Niagara University	
A.B. 1956, University of Arizona		James Colvert Robertson	Pa.
Arthur Johnson	Va.	B.S. 1957, University of Maryland	
A.B. 1955, University of Alabama		Robert Henry Robinson	Ohio
Donald Philip Kohl	Va.	B.S. in Ch.E. 1956, Lehigh University	
A.B. 1955, Ohio State University		George Oscar Saile, Jr.	Md.
Thomas Leo Kubani	Mich.	B.Ch.E. 1953, University of Cincinnati	
B.M.E. 1954, General Motors Institute		Manfred Julius Schmidt	Vt.
George Franklin Lesmes	N.Y.	A.B. 1951, Roosevelt University	
B.S. 1955, College of the City of New York		Richard Huestis Schmidt	
		A.B. 1954, Middlebury College	

Martin Paul Schwadron B.S. 1956, College of the City of New York	N.Y.	Thomas L. C. Vail A.B. 1956, The George Washington University	Va.
Marshall Wayne Sutker B.S. 1954, University of Illinois	Pa.	Alson Pharoah White, Jr. B.S. in C.E. 1948, University of Arizona	Ariz.
Leonard Henry Thornton A.B. 1957, University of Vermont	N.Y.	Arthur Emanuel Wilfond B.S. 1956, Drexel Institute of Technology	Pa.
Charles Merle Tischler A.B. 1952, M.S. 1954, Columbia University	Va.	Jack Havel Williams A.B. 1956, Pennsylvania State University	Pa.
Mary Johnston Turner A.B. 1951, The George Washington University	D.C.	Maynard Lee Youngs A.B. 1954, Kalamazoo College	Va.

JURIS DOCTOR

FEBRUARY 23, 1959

Alan Herbert Bernstein B.S. in Ch.E. 1955, Drexel Institute of Technology	Pa.	James Adalbert Lynn A.B. 1948, A.M. 1959, University of California at Los Angeles	Md.
John Woodland Black M.I.A. 1949, University of Washington	Md.	Richard Marvel Thomas B.S. 1951, U.S. Coast Guard Academy	Conn.
James Edward Cockfield B.Fer.Eng., M.S. 1953, Ohio State University	Ohio	Harold Wayne Wadsworth B.S. 1952, Utah State University of Agriculture and Applied Science	Utah
Ronald D. Haggart A.B. 1956, The George Washington University	D.C.	Daniel Edward Willmore A.B. 1953, Idaho State College	Idaho
Henry Nobuaki Kitamura B.B.A. 1952, University of Hawaii	Hawaii	Jack Pearce Zimmerman B.S. 1948, U.S. Naval Academy	Kans.

JUNE 3, 1959

Walter Lawrence Baumann A.B. 1956, The George Washington University	D.C.	James Thomas Lewis A.B. 1953, Randolph-Macon College	Va.
Charles Wendell Colson A.B. 1953, Brown University	Va.	Thomas Neal McNamara A.B. 1952, Duke University	Va.
Paul Philips Connor B.S. in E.E. 1955, Case Institute of Technology	Va.	Charles James Moeller (With distinction) A.B. 1954, Nebraska Wesleyan University	Nebr.
John Andrew Diaz B.S. in Ch.E. 1952, Lehigh University	Pa.	Robert Hayes Montgomery B.E.E. 1954, The George Washington University	Va.
Herbert Joseph Gildenborn A.B. 1956, The George Washington University	D.C.	Philip Stanley Neal A.B. 1954, University of Colorado	Va.
Philip Arthur Gragan (With distinction) A.B. 1953, The George Washington University	D.C.	Jack Posin B.Mar.Eng. 1951, New York State Maritime College	Va.
Keith Stratford Humphreys B.S. 1955, Brigham Young University	Wyo.	James Henry Rempe A.B. 1956, The George Washington University	Md.
Charles Marvin Kaplan B.S. 1953, Massachusetts Institute of Technology	Tenn.	Warren Herbert Rotert B.S. in A.E. 1952, Lafayette College	Va.
Alan Kay A.B. 1957, The George Washington University	Va.	Richard Willis Schmude A.B. 1953, University of Michigan	Md.
JoAnne Marie Kieley A.B. 1956, Albertus Magnus College	Conn.	Louis Edwin Shomette, Jr. B.S. 1953, Georgetown University	Va.
Wesley Warren Kleeman B.S. in M.E. 1956, University of Michigan	Va.	Richard Joseph Sincoff A.B. 1956, The George Washington University	Md.
Karl Sigurd Landstrom A.B. 1950, A.M. 1952, University of Oregon	Va.	William Harold Stanhagen B.S. in C.E. 1953, University of Southern California	Va.
Donald Richard Levinson A.B. 1953, New York University	D.C.	Edward Morris Statland A.B. in Govt. 1954, The George Washington University	Md.
		John Salvatore Yodice A.B. 1954, Brooklyn College	N.Y.

OCTOBER 17, 1959

Perry Carvellas	Va.	Bruce Gregory Klaas	N.Y.
B.S. 1952, The George Washington University		B.S. in M.E., B.S. in Bus.Mgt. 1956, University of Colorado	
Roger Sundal Dybvig	Va.	Roy Shaw Mitchell	Pa.
B.S. 1955, University of Florida		B.S. 1957, Cornell University	
William Harvey Epstein	N.Y.	Richard Lee Raymond	N.Y.
A.B. 1955, B.S. in Ch.E. 1956, Columbia University		A.B. 1951, Swarthmore College	
William George Evans	D.C.	M.S. 1956, Indiana University	Pa.
A.B. in Govt. 1954, The George Washington University		Stanley Sacks	
		B.S. 1954, Queens College	
		Les J. Weinstein	
		B.S. in M.E. 1956, University of Pennsylvania	

MASTER OF LAWS

FEBRUARY 23, 1959

Ross Warren Cannon	Mont.	Walter Clarence Miller	Pa.
A.B. in B.A. 1951, LL.B. 1957, Montana State University		A.B. 1951, Pennsylvania State University	
Nathan Cass	Md.	LL.B. 1956, The George Washington University	Va.
B.E.E. 1952, New York University		Kenneth Edward Peery	D.C.
LL.B. 1956, The George Washington University		A.B. 1947, Kansas State Teachers College, Emporia	
J. Fred Hamblen	Tenn.	LL.B. 1950, University of Kansas	
B.S. 1947, LL.B. 1949, University of Tennessee		Suzanne Virginia Richards	Md.
Otto Kratochvil	La.	A.B. 1948, J.D. 1957, The George Washington University	
LL.B. 1950, Louisiana State University		Richard Roland Sigmon	
		LL.B. 1957, University of Maryland	

JUNE 3, 1959

Charles David Ablard	Okla.	Marion Edwyn Harrison II	Va.
B.B.A. 1952, LL.B. 1954, University of Oklahoma		A.B. 1951, University of Virginia	
Joseph Warren McNab Darling	Pa.	LL.B. 1954, The George Washington University	Mich.
B.S. 1931, Howard University		Lloyd Edward Hesseaur, Jr.	Va.
M.B.A. 1934, University of Pennsylvania		B.S. in Eng.Law 1955, LL.B. 1957, Wayne State University	
LL.B. 1954, The George Washington University		John Edward Rodgers	D.C.
John Burnison Evans	Va.	LL.B. 1949, Vanderbilt University	
A.B. 1953, University of Virginia		Charles Thomas Vetter, Jr.	Iowa
LL.B. 1958, The George Washington University		A.B. 1946, Hamilton College	
John William Fahrney	Va.	LL.B. 1953, National University	
A.B. 1947, LL.B. 1949, The George Washington University		James Patrick White	
		A.B. 1953, J.D. 1956, State University of Iowa	

OCTOBER 17, 1959

Dorothea Anna Baker	D.C.	Leo Ross	Va.
A.B. 1947, LL.B. 1948, The George Washington University		B.M.E. 1928, Northeastern University	
		LL.B. 1932, The George Washington University	

MASTER OF COMPARATIVE LAW

JUNE 3, 1959

Henning Walter Edward Wegener	Germany
Referendar 1958, University of Bonn,	
Germany	

MASTER OF COMPARATIVE LAW
(American Practice)

FEBRUARY 23, 1959

George Crisan
A.B. 1926, Liceum Moise Nicoara
of Arad, Rumania
LL.B. 1930, King Ferdinand I
University, Rumania
B.D. 1952, Colgate Rochester Divinity
School

Md. Karlis Vilis Kalnins
Diploma in Law 1934, University of
Latvia

Md.

JUNE 3, 1959

Jaroslav George Polach
LL.D. 1938, Masaryk University,
Czechoslovakia
A.M. 1958, American University

D.C.

DOCTOR OF JURIDICAL SCIENCE

FEBRUARY 23, 1959

Robert Milton Schmidt
B.B.A. 1951, M.B.A., LL.B. 1954
University of Michigan
LL.M. 1958, The George Washington
University
Dissertation: "The Criminal Net
Worth Doctrine"

Mich.

STUDENTS REGISTERED IN THE LAW SCHOOL

SPRING 1958-59, SUMMER 1959, AND FALL 1959-60

A			
Abato, Anthony Albert, Jr.	Md.	Asleson, Robert Freeman	Min.
A.B. 1955, University of Maryland		B.S., B.B.A., M.S. in I.E. 1958,	D.C.
Abell, Clyde George, Jr.	D.C.	University of Minnesota	
B.S. 1959, Virginia Polytechnic		Astor, Sanford	Md.
Institute		B.S. in Ch.E. 1958, Purdue University	
Ablard, Charles David	D.C.	Atwood, Newell Arrowsmith	Mo.
B.B.A. 1952, LL.B. 1954, University		A.B. 1932, University of Michigan	
of Oklahoma		LL.B. 1941, The George Washington	
Adams, Don Tisherman	Va.	University	
B.C.E. 1957, University of Florida		Aubuchon, Frank David	Md.
Adams, Harold Wallace	Va.	B.S. in M.E. 1957, University of	
B.S. in E.E. 1954, Purdue University		Missouri	
Agmata, Victor, Jr.	Hawaii	Auerbach, Ernest Sigmund	Va.
Ed.B. 1957, University of Hawaii		A.B. in Govt. 1958, The George	
Alber, Oleg Edward	Va.	Washington University	
B.Ch.E. 1957, Rensselaer Polytechnic		Ayers, James Robert	W.Va.
Institute		B.S. 1957, Virginia Polytechnic	
Albers, Darwin Dee	Nebr.	Institute	
A.B. 1958, University of Maryland		Ayers, Reginald Lee	
Albright, George LaVern	Nev.	B.S. 1952, Bowling Green College of	
B.S. 1954, Brigham Young University		Commerce	
Alford, William Curtis, Jr.	Md.	B	
B.S. 1956, M.B.A. 1957, American			W.Va.
University		Baggott, William Keefe	D.C.
Allnutt, Robert Frederick	Va.	B.S. in I.E. 1957, West Virginia	
B.S. in I.E. 1957, Virginia		University	
Polytechnic Institute		Baker, Dorthes Anna	Va.
Alonzo, Rose Marie Sanchez	Philippines	A.B. 1947, LL.B. 1948, The George	
LL.B. 1956, Manual L. Quezon		Washington University	
University		Baker, Gerald Franklin	Md.
Alvey, Ralph Joseph	D.C.	A.B. 1948, Ed.M. 1956, Lewis and	
B.S. 1950, University of Colorado		Clark College	
Ammerman, Clell Neil	Pa.	Baker, Raymond Edward	Va.
B.S. 1954, U.S. Naval Academy		LL.B. 1956, University of Kansas	
Anderson, Charles Thomas	Fla.	City	
A.B. 1958, Southern Illinois		Ballinger, Willis Jerome	D.C.
University		Ph.B. 1923, Yale University	
Anderson, Kenneth George	N.C.	LL.B. 1957, Detroit College of Law	N.Y.
A.B. 1953, University of North		Band, David Sheldon	D.C.
Carolina		B.S. 1958, University of Maryland	
J.D. 1958, The George Washington		Barber, John Theodore	Mass.
University		A.B. 1959, New York University	
Anderson, Martin	Md.	Barnes, Andrew McReynolds	
B.S. 1951, M.S. 1954, The George		A.B. 1954, Middlebury College	
Washington University		Barron, Jerome Aure	N.Y.
Anibal, Fred Ramon	Fla.	A.B. 1955, Tufts University	
B.S. 1955, Rensselaer Polytechnic		LL.B. 1958, Yale University	Ind.
Institute		Barsky, Ira Philip	Miss.
Antonelli, Donald Ralph	Ill.	B.S. 1959, New York University	
B.S. in E.E. 1957, Purdue University		Bartl, Richard Allen	Pa.
Appleman, Geraldine	D.C.	B.S. 1957, Purdue University	
A.B. 1958, University of Maryland		Barton, Cecil	
Armstrong, Richard V.	Okla.	B.S. 1948, Mississippi State College	Idaho
A.B. 1958, University of Oklahoma		Bashore, Samuel Leon, Jr.	D.C.
Aron, Lewis Greene	R.I.	B.S. in Ch.E. 1955, Drexel Institute	
B.S. 1959, Brown University		of Technology	
Arrington, Paul Bradley	D.C.	Baugh, Vida Marie	
B.S. 1959, Presbyterian College		A.B. 1950, University of Idaho	
Ashland, Calvin K.	Iowa	Baumann, Walter Lawrence	
B.S. 1957, Iowa State College of		A.B. 1956, The George Washington	
Agriculture and Mechanic Arts		University	

Bayar, Belma M.L. 1950, University of Istanbul, Turkey	Turkey	Beyda, Cohen Richard A.B. in Govt. 1959, The George Washington University	D.C.
Baza, Antonio Herrero A.B. 1958, Catholic University of America	Guam	Bienstock, Max Marcus A.B. 1959, Rutgers University	N.J.
Beasley, Charles Earle, Jr. A.B. 1938, M.B.A. 1947, Ohio State University	Va.	Birch, Terrell Calhoun B.E.E. 1959, The George Washington University	Md.
Bestman, James Winfield A.B. 1948, Oberlin College	Va.	Bisker, Clarence Gemmil B.S. 1956, Grove City College	Pa.
A.M. 1949, University of Pennsylvania		Bisson, Gary Bryan A.B. 1959, University of New Hampshire	N.H.
Beaudoin, Claude Leo B.S. 1956, University of New Hampshire	D.C.	Bixler, Harold Randall A.B. 1957, Michigan State University of Agriculture and Applied Science	Va.
Beck, Andrew Joseph B.S. in C.E. 1956, Virginia Polytechnic Institute	Va.	Blair, Charles Hildreth B.M.E. 1958, Cornell University	Va.
Becker, George Dennis A.B. 1956, Swarthmore College	Md.	Blanchard, Albert Chick A.B. 1958, Yale University	Maine
Becker, Roland Wayne A.B. 1958, The George Washington University	Ind.	Blanding, Warren Eddy A.B. 1943, Harvard University	D.C.
Beckwith, Horace Palmer A.B. 1954, Maryville College	N.J.	Blazich, Emil Andrew B.S. 1954, University of Akron	Ohio
Beerman, Bernard Marvin A.B. 1959, Princeton University	Md.	Blech, Samuel Herman B.S. 1950, Brooklyn College	D.C.
Behrt, Yvonne Huguette Licence es lettres 1949, University of Bordeaux, France	Md.	Blitch, Brooks Erwin A.B. 1956, University of Georgia	Ga.
Bell, Harry Clark B.S. 1957, Georgetown University	N.Y.	Block, Daniel Corwin B.S. 1957, Texas Agricultural and Mechanical College	Va.
Beller, Margaret Anne A.B. 1955, A.M. in Ed. 1957, The George Washington University	Md.	Blondin, Carmen Joseph B.S. 1955, U.S. Coast Guard Academy	N.J.
Beltran, Howard B.S. in C.E. 1956, Purdue University	Va.	Blood, Russell McKay A.B. 1951, University of California at Los Angeles	D.C.
Benizman, Marshall Robert B.S. in B.A. 1956, American International College	Mass.	Bodolus, Carl Theodore A.B. in Govt. 1954, The George Washington University	Pa.
Berg, Robert Henry B.S. 1956, State University of Iowa	Iowa	Bohan, Jack Lee B.Met.E. 1956, Rensselaer Polytechnic Institute	Va.
Berg, Egon Edward B.S. 1959, Rutgers University	N.J.	Bolton, Harvey Benjamin, Jr. A.B. 1955, Williams College	D.C.
Berg, Morton A.B. in Govt. 1959, The George Washington University	D.C.	Bonfanti, Reno Elwood A.B. 1953, University of Pittsburgh	Pa.
Bernane, Yohannes A.B. 1952, San Bernardo University, Ethiopia	Ethiopia	Boston, Thomas Ray B.S. 1956, University of Kansas	Va.
Law Degree 1956, Scuola Di Giurisprudenza, Ethiopia		Bound, Arthur Edward B.S. in B.A. 1953, University of Florida	Fla.
Berkheimer, Donald Eugene B.S. 1959, University of Maryland	Md.	Boykin, Lester Junod A.B. 1946, Duke University	D.C.
Bernard, Hugh Yancey, Jr. B.S. in L.S. 1947, Columbia University	Va.	B.S. 1950, U.S. Merchant Marine Academy	
Bernicke, Richard Harris B.S. in Ch.E. 1958, Purdue University	Va.	Bradley, David Owen B.S. in E.E. 1958, Michigan College of Mining and Technology	Mich.
Berul, Lawrence Herbert B.S. 1957, Drexel Institute of Technology	N.J.	Brady, Ernest Spencer B.S. 1949, University of Richmond	Va.
Berrins, Ivars B.S. 1958, Michigan College of Mining and Technology	Mich.	Branscomb, Anne Wells A.B. 1949, University of North Carolina	Md.
Best, Robert Ellis B.E.A. 1954, University of Oklahoma	Va.	A.M. 1951, Radcliffe College	D.C.
Best, Stephen Lewis A.B. 1955, Kenyon College	D.C.	Bratman, Audrey Iris A.B. 1954, Queens College	
Besters, Pratt Gordon B.S. 1956, Brigham Young University	Utah	A.M. 1956, Middlebury College	Pa.
Beutler, Ernest Albert, Jr. B.S. in M.L. 1956, Northwestern University	Va.	Braun, Howard William, Jr. A.B. 1956, Colgate University	D.C.
		Breem, Martin Joseph A.B. 1952, Stanford University	D.C.
		Brekke, Darrell Gene B.S. in E.E. 1954, South Dakota School of Mines and Technology	D.C.

Brener, William Burton	Va.	Butler, James David	Ohio
A.B. 1958, The George Washington University		B.S. 1955, Georgetown University	
Breston, Michael Pemow	Md.	Butler, Robert Edward	D.C.
B.S. 1955, University of Maryland		A.B. 1953, Bowling Green State University	
Bridgens, Burton Gearhart	Iowa	Butowsky, David Martin	Conn.
A.B. 1941, State University of Iowa		A.B. 1958, Temple University	
Bridgman, Alfred Fearing, Jr.	Mass.	Byrd, John Henry, Jr.	Calif.
B.S. 1954, U.S. Coast Guard Academy		B.S. 1952, U. S. Coast Guard Academy	
Broadhead, William Sherwin	Idaho	Byrns, Kenneth Antrim	
A.B. 1956, Idaho State College		A.B. 1935, Colorado State College of Education	
Bronczyk, Arthur Francis	Va.	A.M. in Govt. 1943, The George Washington University	Md.
A.B. 1954, Maryknoll College		Byron, Goodloe Edgar	
Brooke, Alban Emerson	Md.	A.B. 1951, University of Virginia	
A.B. 1953, The Citadel	Fla.	J.D. 1953, The George Washington University	
Brophy, Gilbert Thomas	Md.		
B.S. in B.A. 1949, University of Florida			
Brown, Donald Carroll	Nebr.		
A.B. 1952, University of Vermont			
Brown, George Frederick	Del.	Cacchillo, Anthony Francis	Conn.
B.S. 1955, University of Wyoming		B.S. 1953, University of Connecticut	
Brown, Grover Cleveland	Va.	M.S. 1954, University of Tennessee	D.C.
A.B. 1957, University of North Carolina		Cacheris, James Chris	Va.
Brown, Harlan James		B.S. 1955, University of Pennsylvania	
Met. Eng. 1957, Colorado School of Mines	Kans.	Caffrey, Charles Augustine	Wis.
Brown, Sarah Eleanor		A.B. 1952, Wilkes College	
A.B. 1958, Vassar College	Va.	Cahill, Robert Allen	
Brown, Theodore Locke		B.S. in E.E. 1956, University of Wisconsin	Va.
A.B. 1955, Colby College	Md.	Cahill, William Charles	Del.
Brown, William McCormick		B.E.E. 1955, B.M.E. 1956, University of Akron	
A.B. 1956, Duke University	Md.	Calloway, James Richard	Va.
Bruno, Mona Constance		A.B. 1959, The George Washington University	
A.B. 1950, Trinity College	Va.	Campbell, Barbara	Calif.
A.M. 1952, Catholic University of America		LL.B. 1950, The George Washington University	
Bryan, David Carvel	Mich.	Campbell, Donald Eugene	Va.
B.S. in B.A. 1955, Georgetown University		A.B. 1959, The George Washington University	
Bryant, Willard Edward	Md.	Campbell, James, Jr.	D.C.
B.S.E. 1958, University of Michigan		B.S. in E.E. 1956, University of Colorado	
Brzozowski, Edmund	Md.	Campbell, Lawrence Ray	D.C.
B.S.E. 1950, The George Washington University		B.S. in B.A. 1956, University of Arizona	
Buck, Richard Sutton IV	D.C.	Canal, Albert Philip	Md.
A.B. 1958, University of Maryland		B.S. in E.E. 1958, University of Missouri	Ohio
Buckley, Frank Lawrence	Pa.	Canby, Thomas Yellott, Jr.	
B.S. in B.A. 1956, Georgetown University		A.B. 1952, University of Virginia	Pa.
Bullock, Chares Arthur	Idaho	Cannon, Eugene Paul	
A.B. 1954, Franklin and Marshall College		B.S. 1952, University of Kentucky	
Bullock, Joseph Jay	D.C.	Cantor, Jay M.	Md.
B.S. 1954, Brigham Young University		B.S. in E.E. 1956, A.B. 1957, University of Pennsylvania	D.C.
Bulman, Leonard Zinnamon	Nev.	Caplan, Donald Marvin	
A.B. 1956, University of Maryland		B.S. 1954, University of Maryland	
Bunker, Richard Wendell	Va.	Capps, Anna Joyce	Wash.
B.S. 1959, Brigham Young University		A.B. 1957, The George Washington University	
Burke, Joseph Patrick	Pa.	Carlisle, Dale Louis	S.D.
B.S. 1955, Marquette University		B.S. in B.A. 1957, University of Idaho	
Burkhardt, James Ignatius	S.C.	Carlson, Loren Merle	N.Y.
B.S. 1956, Pennsylvania State University		A.B. 1948, Yankton College	
Burnett, Robert Franklin	N.J.	A.M. 1952, University of Wisconsin	
B.S. 1956, Clemson Agricultural College		Carlson, Marcia Ann	
Burnett, George James	Va.	A.B. 1956, The George Washington University	
A.B. 1958, Upsala College	Utah		
Burrows, Lawton Arthur, Jr.			
B.Ch.E. 1957, University of Delaware			
Burton, Stewart Dawson			
A.B. 1951, Brigham Young University			

Carahan, Lafayette Ernest B.S. 1957, Utah State University of Agriculture and Applied Science	D.C.	Cibinic, John, Jr. A.B. 1956, University of Pittsburgh	Va.
Carney, Helen Ann B.S. 1953, Syracuse University	N.Y.	Clack, David Arthur A.B. 1957, University of Washington	Wash.
Carney, John Francis B.S. in M.E. 1957, Northeastern University	Mass.	Clark, Barry Loomis B.S. in M.E. 1956, Northwestern University	Va.
Carpenter, William Otis A.B. 1950, The George Washington University	Va.	Clifton, Noel Samuel B.S. in Com. 1952, University of Virginia	Va.
Carson, James Berkley A.B. 1954, A.M. 1955, The University of Maryland	Md.	Clingan, Thomas Akroyd, Jr. B.S. 1950, U. S. Coast Guard Academy	Pa.
Carter, Joseph Lester, Jr. B.S. 1958, Maryland State Teachers College, Frostburg	Md.	Cobb, Alan Elmer B.S. 1954, Bowling Green State University	D.C.
Carter, Ronald Gary A.B. 1956, Brigham Young University	Md.	Coble, Paul Maxwell B.S. 1957, M.S. 1958, Massachusetts Institute of Technology	D.C.
Carvillas, Perry B.S. 1952, The George Washington University	Ill.	Cockfield, James Edward B.Pet.Eng., M.S. 1953, Ohio State University	D.C.
Carver, Harry Swentzel A.B. 1955, College of William and Mary	Va.	Codd, William Andrew B.S. 1957, University of Arizona	Texas
Casey, Michael Thomas B.S. 1959, Georgetown University	Md.	Coffey, Kenneth James B.S. 1955, Northwestern University	Ariz.
Casidy, John Robert B.S. in I.E. 1953, Pennsylvania Military College	Va.	Coffman, Edgar Ronald B.S. in M.E. 1958, University of Michigan	Canada
Casidy, Thomas Kohler B.S. 1953, University of Wyoming	Pa.	Coffman, Gordon Crabb A.B. 1959, Brigham Young University	Va.
Catalano, Richard Michael A.B. 1955, Bowdoin College	N.Y.	Coffman, Arthur Steven B.S. 1958, The George Washington University	Utah
Cathers, Lincoln Drury B.S. 1956, Webb Institute of Naval Architecture	Md.	Cohen, Bruce Jerome A.B. 1959, Michigan State University of Agriculture and Applied Science	D.C.
Centola, David Daniel B.S. 1949, Fordham University	Va.	Cohen, Jerry B.S. in M.E. 1957, Rensselaer Polytechnic Institute	N.Y.
Cerrick, Peter Aull A.B. 1953, The George Washington University	D.C.	Cohen, Stanley Howard B.S. 1957, Drexel Institute of Technology	Va.
Chandonnet, Noel Andrew B.S. 1956, Georgetown University	Md.	Cohn, Leonard Earl A.B. in Govt. 1950, The George Washington University	D.C.
Charlton, Walter Theodore B.S. 1952, University of Maryland	Korea	Colaanni, Joseph Vincent B.E.E. 1956, University of Detroit	Mich.
Charlton, William Dickerson B.S. 1954, University of Maryland	Vt.	Coleman, James Harvey Collins, Josiah William	W.Va. Ill.
Chae, Choung Il B.S. 1956, Georgetown University	Va.	Collins, Richard Wayne B.S. in Ch.E. 1956, Oklahoma State University	Okla.
Cheever, Alan William B.S. 1958, New England College of Pharmacy	Ill.	Collins, Robert Terrance B.S. in E.E. 1953, Missouri School of Mines and Metallurgy	N.Y.
Chester, Richard Benjamin, Jr. A.B. 1957, Tufts University	Ohio	Collins, Roger Duane B.S. in C.E. 1957, University of Texas	Va.
Childress, George Herman B.S. 1952, Oklahoma State University	Va.	Colombo, Louis Robert A.B. 1950, Muhlenberg College	Pa.
Childress, Richard Harvey B.S. 1954, U. S. Naval Academy	D.C.	Colon, George Matthew B.S. in C.E. 1955, Villanova University	Va.
Chilton, Ralph Henry B.S. in M.E. 1952, Purdue University	Utah	Colson, Charles Wendell A.B. 1953, Brown University	Va.
Chis, Gay B.S. in M.E. 1946, Oregon State College of Oregon	Va.	Comstock, Austin Brundage A.B. 1956, Northwestern University	Va.
Choulekha, Panlop B.S. 1954, Thammasat University, Thailand	D.C.	Conner, Kurt Rickey A.B. 1958, Guilford College	N.C.
Christenson, Gordon A. B.S. 1955, LL.B. 1956, University of Utah	Va.		
Church, Lawrence Brehaut A.B. 1959, The George Washington University			

Connor, Paul Phillips B.S. in E.E. 1955, Case Institute of Technology	Va.	Cridle, Byron Deon B.S. 1956, Utah State University of Agriculture and Applied Science	Va.
Conrad, Benjamin Franklin B.S. 1947, Dickinson College	Md.	Cridlin, William Branner, Jr. B.S. 1955, Virginia Military Institute	Hawaii
Conrad, David Richard B.S. in M.E. 1955, University of Colorado	Md.	Crockett, Wendell Ryder A.B. 1951, Western Michigan College LL.B. 1956, The George Washington University	Ill.
Constant, Richard Edward B.S. in E.E. 1959, University of Colorado	N.Y.	Cromwell, James Hamilton B.S. 1951, Bradley University Ed.M. 1954, University of Illinois	N.Y.
Constantinople, James Dowling A.B. 1957, Amherst College	D.C.	Crook, Gerard Beekman A.B. 1929, Williams College J.D. 1932, New York University	Calif.
Cook, Joseph Allen A.B. 1953, University of Maryland	Md.	Crowe, William James, Jr. B.S. 1946, U. S. Naval Academy A.M. 1956, Stanford University	N.Y.
Cooke, Joseph Allan B.S. in C.E. 1957, Drexel Institute of Technology	Pa.	Croyle, Carlton Ruhle B.M.E. 1956, Clarkson College of Technology	D.C.
Cooper, George Madison B.S. in E.E. 1957, Pennsylvania State University	Va.	Crump, Edmund Parke A.B. 1957, The George Washington University	Va.
Cooper, Hal Dean B.S. 1957, State University of Iowa	Iowa	Cullen, David Paul B.S. in C.E. 1956, M.S. in C.E. 1957, University of Oklahoma	Va.
Cooper, Richard Clarence B.S. 1956, Michigan College of Mining and Technology	Va.	Cullen, Robert Scott A.B. 1954, Washington and Lee University	D.C.
Corbus, William Rudolph A.B. 1955, Brown University	Calif.	Cummings, Lilla Burt A.B. 1949, The George Washington University	N.Y.
Corcoran, James Thomas Ed.B. 1951, University of Miami A.M. 1956, Yale University	Fla.	Curry, Donald Charles A.B. 1950, Hamilton College A.M. 1954, Johns Hopkins University	Pa.
Corey, William Sanford A.B. 1958, Dickinson College	Md.	Cushman, Charles Arthur A.B. 1950, University of North Carolina	Va.
Corley, Kelly Ozzelle B.S. 1955, Mississippi College	Va.	Cykowski, Elizabeth Elder A.B. 1951, Rutgers University	Utah
Cornbrooks, James Ernest B.S. 1950, Florida State University	D.C.		
Cornell, Ronald S. B.S. 1956, Queens College	Va.		
Corsini, Timothy Allen B.S. 1950, Fairmont State College	Va.		
Costello, Roger Joseph A.B. 1948, University of Cincinnati M.B.A. 1951, Harvard University	Va.	Dahlstrom, John Alexander B.S. 1956, University of Utah	Va.
Cowley, Samuel Parkinson B.S. 1950, University of Utah	Utah	Dailey, Henry Elwood A.B. 1951, Duke University	Md.
Cox, Henry Bartholomew A.B. 1950, Princeton University	D.C.	Daisley, William Prescott A.B. 1959, Randolph-Macon College	La.
Cox, William Edward A.B. 1954, Bucknell University	Va.	Dalgarn, Lewis McClellan B.E. 1947, Vanderbilt University	Va.
Crabtree, Granville Hayward, Jr. B.S. 1956, University of Missouri	Va.	Dameron, Roland Meade, Jr. B.S. in E.E. 1957, Virginia Polytechnic Institute	Ohio
Crabtree, Thomas Randall A.B. 1950, Hanover College	D.C.		
Craig, John David A.B. 1957, Indiana University	Va.	D'Amico, Louis Joseph A.B. 1956, The George Washington University	N.Y.
Cramer, Richard Benjamin A.B. 1959, University of Michigan	Pa.	Danforth, Frederick Wilcox, Jr. A.B. 1950, Princeton University LL.B. 1954, Cornell University	Va.
Cramp, Barry Shields A.B. 1958, Colgate University	N.J.	Daniels, Edward Kent, Jr. B.S. in M.E. 1955, West Virginia University	Md.
Cranwell, George Edward B.S. 1954, St. Peter's College	Md.		
Craven, William Kyler A.B. in Govt. 1958, The George Washington University	Ga.	Danziger, Leonard B.Ch.E. 1956, College of the City of New York	Va.
Crawford, Robert Jerry B.S. in E.E. 1957, Virginia Polytechnic Institute	Va.	Dargon, Paul Francis B.S. 1955, American University	Pa.
Creer, John Preston B.S. 1957, University of Utah	Utah	Darling, Joseph Warren B.S. 1931, Harvard University M.B.A. 1934, University of Pennsylvania	
Creveling, Cyrus Robbins B.S. 1953, M.S. 1955, The George Washington University	Md.	LL.B. 1954, The George Washington University	

Devila, Roman Hector A.B. 1958, Polytechnic Institute of Puerto Rico	Puerto Rico	Diggins, John M. A.B. 1955, Cornell University	Pa.
Davis, Akin Thornwall B.Ch.E. 1953, University of Delaware	D.C.	Diuguid, John Powell A.B. 1954, Virginia Military Institute	Md.
Davis, Chester Leslie, Jr. B.S. in E.E. 1957, University of Missouri	Mo.	Dively, Robert Roy A.B. 1957, Pennsylvania State University	Va.
Davis, Ira Lewis A.B. 1956, University of North Carolina	N.J.	Dixon, Harold Anthony B.E.E. 1954, New York University	N.Y.
Davis, James Clark, Jr. B.S. in E.E. 1955, Brown University	Va.	LL.B. 1958, The George Washington University	
Davis, Michael Harding B.S. 1958, Utah State University of Agriculture and Applied Science	Utah	Dixon, Ronald Olson A.B. 1959, Brigham Young University	D.C.
Davis, Wilbur Chamberlain A.B. 1950, University of Maryland	Md.	Doak, James Frederick A.B. 1956, University of Kansas	Okla.
LL.B. 1953, The George Washington University		Doescher, Howard Donald B.S. in Ch.E. 1948, University of Denver	Okla.
Davitt, Alan Park A.B. in Govt. 1957, The George Washington University	D.C.	Doherty, Robert James, Jr. B.S. in Ch.E. 1957, Northeastern University	Mass.
Deal, Beverly Ann A.B. 1958, High Point College	N.C.	Donato, Dan, Jr. B.S. 1950, College of Charleston	Va.
DeArment, Phillip Leroy B.S. in E.E. 1957, University of Pittsburgh	Va.	Donovan, Daniel Gerald A.B. 1951, Brown University	Va.
Debenham, Shirle Arthur A.B. 1950, University of Utah	Utah	Downs, Ernest Willard B.S. in M.E. 1959, University of Michigan	Va.
Dee, Blecker A.B. 1950, Yale University	Va.	Dowrey, Carl Gordon B.S. 1958, Montana State College	Va.
A.M. 1958, Mexico City College		Drucker, Teviah E. B.S. 1956, University of South Carolina	S.C.
A.B. 1949, College of William and Mary	Va.	Drummond, Douglas Jay B.S. 1950, University of Maryland	D.C.
de Laski, Donald A.B. 1954, Duke University	Va.	Duckworth, Robert Wells B.I.E. 1957, University of Florida	Fla.
De Lorenzo, Richard Allan B.S. 1959, Fordham University	N.Y.	Duffy, Christopher Ogden B.C.E. 1953, Georgia Institute of Technology	D.C.
De Martino, Maurizio Furio A.B. in Govt. 1958, The George Washington University	D.C.	Dugan, Joseph Franklin A.B. 1957, Pennsylvania State University	N.J.
Dempsy, John Edmund B.S. 1956, Lemoine College	Va.	Duggan, James Francis B.S. 1953, Georgetown University	Md.
Demson, Donald Lee B.S. in M.E. 1955, Carnegie Institute of Technology	Md.	Dulan, Joseph Franklin A.B. 1957, Pennsylvania State University	N.J.
Demson, Robert Abel, Jr. B.C.E. 1948, Rensselaer Polytechnic Institute	Va.	Dunaway, George Baxter B.S. 1950, Alabama Polytechnic Institute	D.C.
Demuy, James Edward B.S. in E.E. 1955, Johns Hopkins University	Va.	Dunn, James Joseph B.S. 1957, John Carroll University	Va.
Depew, Samuel Harry III B.S. 1949, Purdue University	Md.	Dunton, Ronald Kaye A.B. 1954, Dartmouth College	N.J.
Deber, Frederick Joe B.S. 1953, Ohio State University	Ohio	DuPont, Clyde Stanley B.S. 1959, Brigham Young University	Hawaii
Devine, William Francis A.B. 1955, Kansas State Teachers College	Kans.	Durham, Henry Coleman B.S. 1951, University of Kentucky	Ky.
Diamond, George Nathan A.B. 1950, American University	D.C.	Durland, William Reginald A.B. 1953, Bucknell University	Va.
Diaz, John Andrew B.S. 1952, Lehigh University	Pa.	LL.B. 1950, Georgetown University	
Dickey, William Lee A.B. 1957, Augustana College	S.D.	Duvall, John Hart A.B. 1955, Principia College	Va.
Dickinson, William Boyd III A.B. 1953, University of Kansas	Md.	Dwinell, Davis Blair B.S. 1957, Pennsylvania State University	D.C.
Dickson, William Bush A.B. 1958, University of New Mexico	N.M.	Dybrig, Roger Sundal B.S. 1955, University of Florida	Va.
Dickson, Wallace Gordon A.B. 1950, The George Washington University	Va.		

E			
Easter, George Cordell		Epstein, William Harvey	N.Y.
A.B. 1956, Princeton University		A.B. 1955, B.S. in Ch.E. 1956,	Va.
Eastwood, Charles Robert	Ohio	Columbia University	Va.
B.S. in M.E. 1946, B.S. in C.E. 1947		Erdmann, Robert Hodgskin	Va.
University of Virginia		A.B. 1958, University of Vermont	N.C.
M.B.A. 1950, Harvard University		Erickson, Roger James	
Eberhart, Francis Claude	Fla.	B.S. 1957, Wisconsin State College	
A.B. 1940, University of Dubuque		Ervin, Margaret Leslie	Va.
LL.B. 1948, University of Florida		A.B. 1952, University of North	
Ebert, Paul Burns	Va.	Carolina	
A.B. 1959, Virginia Polytechnic		Esgain, Albert James	
Institute		A.B. 1936, A.M. 1938, Ohio State	
Eden, Alan Whitney	D.C.	University	
A.B. 1954, Ohio Wesleyan University		LL.B. 1943, Duke University	D.C.
Edwards, Gordon Beamon	Ill.	Diploma in International Law 1956,	
B.S. 1955, Miami University		University of Cambridge, England	Ind.
Edwards, Howard Lee	Utah	University of Cambridge, England	
B.S. 1955, Brigham Young University		Eskein, Otho Evans	
Edwards, Malcom Koons	Ind.	A.B. 1956, Bowdoin College	
A.B. 1955, Wabash College		Espe, James Elliott	
Egan, Donald Erskine	Va.	Esterlitz, Alvin Morton	Va.
B.S. 1956, Pennsylvania State		B.S. in Ch.E. 1954, Drexel Institute of	
University		Technology	
Eichelburg, Robert Jamil	Va.	Evans, John Burnison	
B.S. 1956, Fordham University		A.B. 1953, University of Virginia	
Eichler, Bessie Hannah	Md.	LL.B. 1958, The George Washington	
B.S. 1927, Beloit College		University	
Eichler, John Alfred	Md.	Evans, John Charles	Va.
B.S. 1957, University of Maryland		B.S. in C.E. 1955, University of	
Ellert, Robert Bernard	D.C.	Michigan	
A.B. 1947, B.C.L. 1949, College of		Evans, Joyce L.	D.C.
William and Mary		A.B. 1952, The George Washington	
Ellingsberg, Donald James	D.C.	University	
B.S. in I.E. and Mgt. 1955, North		Evans, William George	Mich.
Dakota Agricultural College		A.B. in Govt. 1954, The George	
Elliott, Jerry Deon	D.C.	Washington University	
A.B. in Govt. 1957, The George		Ewert, Alfred Paul	
Washington University		B.S. in E.E. 1955, University of	
Elliott, John Earle, Jr.	Md.	Michigan	
A.B. 1956, The George Washington			
University		F	
Ellis, Catherine Martha	Md.	Fahrney, John William	Va.
A.B. 1954, Trinity College		A.B. 1947, LL.B. 1949, The George	
Ellis, John Pope	Pa.	Washington University	
A.B. 1954, Allegheny College		Fahy, George Herbert	Pa.
Ellsworth, Darr Kirk	Utah	A.B. 1954, The George Washington	
A.B. 1950, Brigham Young		University	
University		Falk, Julian	S.C.
Elson, Quin Samuel	Va.	B.S. 1957, Pennsylvania State	
A.B. 1956, The George Washington		University	
University		Farabow, Ford Franklin, Jr.	Del.
Elwell, Richard Brans	D.C.	B.S. 1959, Clemson Agricultural	
A.B. 1953, University of Virginia		College	
Emerson, Frederick George	N.M.	Faulkner, James Marshall	Va.
B.S. 1957, Georgetown University		A.B. 1929, Washington and Lee	
Engel, Ronald Lee	Ill.	University	
B.S. in Ch.E. 1959, University of		Faw, Price Constantine, Jr.	Va.
Illinois		B.M.E. 1954, Clemson Agricultural	
Engelhard, Sheldon	N.Y.	College	
B.S. 1957, Lehigh University		Fedderson, Ralph Henry	Md.
Engle, Samuel William	Va.	A.B. 1940, The George Washington	
B.S. 1953, Pennsylvania State		University	D.C.
University		Fehnel, Paul Oliver, Jr.	
Englert, Alvin John	Va.	B.S. in Phar. 1954, Temple University	
B.S. 1957, Carnegie Institute of		Felder, Clarice Rose	D.C.
Technology		A.B. 1956, The George Washington	
Enockson, Gene Oliver	N.D.	University	
B.S. 1954, Jamestown College		Feldman, Sheldon	Conn.
Ephraim, Allan Malvin	Okla.	A.B. 1957, The George Washington	
B.B.A. 1955, University of		University	
Oklahoma		Feldmann, John Arthur Fridolin	
		A.B. 1954, Harvard University	

Femia, Vincent James A.B. in Govt. 1959, The George Washington University	D.C.	Forester, John Gordon, Jr. B.S. 1955, University of North Carolina	N.C.
Ferrara, Carl Vincent A.B. 1953, Kent State University	Va.	Fox, James Harold B.S. in B.A. 1948, University of Tennessee	Va.
Ferry, Daniel Bradford B.S. 1951, A.M. 1953, University of Delaware	Del.	LL.B. 1955, University of Miami	N.Y.
Fetta, Frank Louis A.B. 1954, Providence College	Va.	Fox, Jerome A.B. 1953, Clark University	Md.
Fetterolf, Wallace Kermit A.B. in Govt. 1950, The George Washington University	Va.	Foxvog, Donald Rogers B.S., A.M. 1947, University of Illinois	Iowa
Feuer, Semi A.B. 1958, The George Washington University	D.C.	Francois, Francis Bernard B.S. 1956, Iowa State College of Agriculture and Mechanical Arts	D.C.
Ficca, David Robert B.S. 1953, Fordham University	Pa.	Franklin, Daniel Tobias A.B. 1956, The George Washington University	Italy Pa.
Fichtner, Herman A.B. 1950, Syracuse University	Va.	Franzosi, Mario Freeh, William Lambert B.M.E. 1957, University of Dayton	D.C.
M.B.A. 1958, University of Pennsylvania		Freeman, Edward James A.B. 1954, Johns Hopkins University	Va.
Fields, Gary Dee B.S. 1956, State University of Iowa	Md.	Freilich, Arthur B.E.E. 1956, Rensselaer Polytechnic Institute	Va.
Fields, Melvin Davison A.B. 1936, University of South Dakota	Md.	Friend, Hilbert Eugene B.S. in Ed. 1950, West Virginia University	Md.
M.S. 1938, Iowa State Teachers College	Pa.	Fryer, William Thomas III B.S. in E.E. 1955, Lafayette College	D.C.
Fierange, LeRoy A.B. 1958, Wilkes College	Va.	Fugh, John Liu B.S. in F.S. 1957, Georgetown University	Calif.
Filcik, Julius Paul B.S. in Ed. 1953, Pennsylvania State Teachers College, Indiana	N.J.	Fumino, Hidemi A.B. 1956, Stanford University	Md.
Finkelstein, Jay Marvin B.S. in E.E. 1959, Drexel Institute of Technology		Futterer, Charles Christopher A.B. 1959, University of Maryland	
Finney, Charles Narber A.B. in Govt. 1959, The George Washington University	D.C.	G	
Fischer, Nancy Jean B.S. 1954, Northwestern University	Ill.	Gabel, Carl William A.B. 1955, University of Illinois	Md.
Fischer, Philip Benjamin A.B. 1956, Adelphi College	N.Y.	Gaffey, James Richard B.S.L. 1953, University of Minnesota	Calif.
Fishman, Alan Donald B.S. in Phar. 1957, The George Washington University	D.C.	Gaither, H. Rowan III A.B. 1956, A.M. 1958, University of California	Mass.
Fitzsimmons, John Joseph A.B. 1956, University of Notre Dame	N.Y.	Gallagher, John Edward A.B. 1959, The George Washington University	D.C.
Fiadager, Dean Alonzo B.S. 1955, Gonzaga University	D.C.	Gallagher, William Michael A.B. (C.G.S.) 1958, The George Washington University	Ill.
Flannery, John Harold, Jr. LL.B. 1958, Wilkes College	Va.	Garbow, Melvin Carl B.S. 1955, Purdue University	N.H.
Fleming, Clarence Joseph B.S. in C.E. 1952, University of Illinois	Va.	Gardner, Laurence Frederick A.B. 1957, Dartmouth College	Va.
Fleming, Edmund Eugene B.S. in F.S. 1959, Georgetown University	Va.	Garner, Howard Garfield, Jr. B.S. 1956, Clemson Agricultural College	Iowa
Fletcher, Thomas William A.B. 1951, College of Wooster	Pa.	Garretson, William Wendell A.B. 1956, Iowa Wesleyan College	Pa.
Floyd, Elbert Frederick B.S. 1949, University of Oregon	Md.	Garrett, Arthur Sellers B.Ch.E. 1959, Rensselaer Polytechnic Institute	D.C.
Flynn, Thomas William A.B. 1956, University of South Carolina	N.Y.	Garrett, Paul Weatherly A.B. 1949, LL.B. 1956, The George Washington University	Maine
Foelken, Arthur Herbert B.S. in E.E. 1951, Lehigh University	Md.	Gaulin, Edward Francis B.S. 1959, Georgetown University	Ill.
Foltz, Jack Lloyd B.S. 1957, Rose Polytechnic Institute	Ind.	Geppert, James Alan B.S. in C.E. 1955, Northwestern University	

Germain, Everett Grant, Jr. B.S. in E.E. 1953, Virginia Polytechnic Institute	Va.	Gordon, Hugh Lee B.S. in E.E. 1952, University of Maryland	Va.
Geschickter, Charles Freeman, Jr. A.B. 1955, Wesleyan University	Va.	Goshorn, Elmer Ellsworth B.S. in M.E. 1955, Northwestern University	Ill.
Gibson, Thomas Joseph B.E.E. 1956, Rensselaer Polytechnic Institute	D.C.	Gough, Gerald Francis A.B. 1956, University of Maryland	Md.
Gild, Bernard S. B.B.A. 1957, University of Pittsburgh	D.C.	Gould, Gloria Jeanette A.B., A.M. 1950, New York State College for Teachers, Albany	N.Y.
Gildenhorn, Herbert Joseph A.B. 1956, The George Washington University	D.C.	Gregan, Philip Arthur A.B. 1953, J.D. 1959, The George Washington University	D.C.
Gill, John Francis B.S. in B.A. 1951, Fordham University	N.Y.	Graham, George Gordon A.B. 1955, Harvard University	Mass.
Gill, Marion Sherman B.S. 1954, Arkansas Agricultural and Mechanical College	Ark.	Graham, John Goodwin B.E.E. 1957, University of Virginia	Va.
Gillespie, Donald Edward B.S. 1955, Virginia Military Institute	Va.	Grant, David Franklin B.S. 1950, University of Vermont	Md.
Gillette, Galen Gerald B.S. 1958, University of South Dakota	Va.	Grant, Reina Alice A.B. 1956, The George Washington University	Md.
Gingery, C. Arden A.B. 1928, University of California at Los Angeles	Calif.	Grant, William Arthur B.S. 1948, University of Pennsylvania	N.Y.
LL.B. 1931, University of Southern California		A.M. 1949, Columbia University	D.C.
LL.M. 1953, Georgetown University		Gratsias, Stylianos John A.B. 1959, The George Washington University	N.Y.
Gioia, Vincent Gerard Met. Eng. 1956, Colorado School of Mines	Va.	Graves, Charles Edgar A.B. 1953, B.S. in I.E. 1954, Columbia University	Va.
Glaser, Darrow A.B. 1957, University of Maryland	Md.	Graves, Donald William B.C.E. 1957, Cornell University	La.
Glasser, Milton Jay B.S. 1955, College of William and Mary	Md.	Green, Henry G. A.B. 1958, Louisiana State University	D.C.
Gleeson, Andrew Thomas A.B. 1957, University of Maryland	Md.	Greene, Roosevelt Brown A.B. 1958, The George Washington University	N.Y.
Glenn, Gene Wallace A.B. 1950, State University of Iowa	Iowa	Greenwald, Paul Clifford A.B. 1957, Lehigh University	Pa.
Goldberg Robert Louis B.S. 1959, Northeastern University	Mass.	Greenwood, James Thomas A.B. 1954, Pennsylvania State University	Conn.
Goldberg, Ronald Sanford B.S. 1955, University of Maryland	Md.	Gregory, James Peter A.B. 1956, Brown University	D.C.
Goldhammer, Joel S. B.S. 1958, Carnegie Institute of Technology	Pa.	Grieder, Paul Martin A.B. 1958, University of Texas	Va.
Goldsmith, James Alfred III A.B. 1957, Brown University	Conn.	Griffin, Benjamin Franklin B.E.E. 1951, University of Virginia	N.C.
Goldstein, Morton Norman A.B. 1957, University of Maryland	D.C.	Griffin, David Wayne A.B. 1956, Catawba College	Va.
Goldstein, Stanley Marvin A.B. in Govt. 1959, The George Washington University	Md.	Grinnell, John Robert B.S. in P.E. 1950, A.M. in Ed. 1951, The George Washington University	N.J.
Golembe, Carter H. A.B. 1946, A.M. 1947, Ph.D. 1952, Columbia University	Va.	Grossman, Joseph A.B. in Govt. 1959, The George Washington University	Iowa
Golob, Howard Morris B.B.A. 1958, Hofstra College	N.Y.	Groves, Gary Jackson A.B. 1959, State University of Iowa	Va.
Gomez-Gil, Manuel Orlando Doctor of Law 1950, University of Havana, Cuba	D.C.	Grubbs James Carper, Jr. A.B. 1949, West Virginia University	Ill.
Gonzalez, Pedro Adolfo B.S. in B.A. 1951, The Citadel	Md.	Guerin, Thomas Elwood B.S. in E.E. 1958, University of Illinois	D.C.
Goody, Percy Edward A.B. 1954, University of Maryland	Md.	Guerrieri, Harry Joseph, Jr. A.B. 1952, St. Vincent College	Pa.
Gordon, Gerald Francis A.B. 1958, Minnesota State Teachers College, Mankato	Minn.	Guerrini, Sylvester Joseph B.S. in C.E. 1956, Carnegie Institute of Technology	Mo.
Gordon, Harvey Jack B.B.A. 1952, College of the City of New York	Md.	Gunn, Lawrence Dwight, Jr. A.B. 1956, University of Missouri	
M.P.A. 1956, Harvard University			

Gunod, Seymour David A.B. in Govt. 1949, The George Washington University	Md.	Harper, William Risque A.B. 1956, The George Washington University	Ky.
Guttman, Robert Michael A.B. 1952, Harvard University	D.C.	Harrigan, Thomas Joseph A.B. in Govt. 1959, The George Washington University	Va.
H		Harris, Patricia Roberts A.B. 1945, Howard University	D.C.
Haft, Roger J. B.S. in M.E. 1958, Ohio University	D.C.	Harris, Sidney B.B.A. 1953, College of the City of New York	N.Y.
Hagen, John Holte A.B. 1956, St. Olaf College	D.C.	J.D. 1957, The George Washington University	
Hagenlock, Raymond Ernest A.B. 1957, Syracuse University	D.C.	Harris, Thomas Greer, Jr. A.B. 1956, University of Maryland	Md.
Haines, Dennis B.S.C. 1959, Ohio University	Ohio	M.C.P. 1959, University of Pennsylvania	
Hall, Blair Parks A.B. 1952, University of Maryland	Md.	Harrison, Thomas Emil B.E. 1954, Johns Hopkins University	Md.
Hall, Brian Lionel A.B. 1957, University of Nevada	Nev.	Harsh, Richard Stanley B.S. 1948, U. S. Military Academy	Va.
Hall, Henry Lyon, Jr. A.B. 1953, University of Massachusetts	Va.	Hawes, James Edmond B.S. in E.E. 1957, University of Illinois	D.C.
Hall, Jack Herbert B.Ch.E. 1957, Rensselaer Polytechnic Institute	Va.	Hawes, John David B.S. in M.E. 1957, University of California	Va.
Halow, Mary A.B. 1956, The George Washington University	Md.	Hayes, William Kenneth B.S. 1951, Fordham University	Md.
Halper, John Benjamin Stanley B.S. 1946, A.M. 1947, Columbia University	D.C.	Haynes, Harry James M.D. 1938, The George Washington University	Va.
Halvorsen, Ronald Moyer B.S. in C.E. 1957, Drexel Institute of Technology	Va.	Hazzard, John Patrick, Jr. B.Ch.E. 1956, University of Delaware	Del.
Hambleton, Neal A.B. 1956, University of Delaware	Del.	Heeb, Louis Francis B.M.E. 1955, General Motors Institute	Ind.
Hamel, Reginald Stanley A.B. 1954, Duke University	N.C.	Hege, William Edwin B.S. 1949, Georgetown University	D.C.
Hamill, James John B.M.E. 1957, Georgia Institute of Technology	Va.	Heinke, Lowell Lock B.S.E. 1954, Case Institute of Technology	Va.
Hamilton, Clyde Henry, Jr. B.S. 1956, Wofford College	S.C.	Held, John Charles A.B. 1957, Rice Institute	Texas
Hamilton, Janace Ann A.B. in Govt. 1959, The George Washington University	Okla.	Henderson, Douglas Boyd B.S. 1957, Pennsylvania State University	Va.
Hamilton, John Colvin, Jr. A.B. 1954, Duke University	Va.	Henderson, Walter B.S. 1953, U. S. Military Academy	D.C.
Hanson, William Joseph B.M.E. 1953, The George Washington University	Va.	Hendriksen, Leah Kirstina B.S. in Ed. 1932, M.S. 1953, University of Michigan	D.C.
Handley, Earl Leslie A.B. 1955, University of Colorado	Va.	A.M. 1936, Columbia University	Calif.
Hanna, Warren Lee A.B. 1955, Washington University	Va.	Hendrix, Frederic Perry A.B. 1956, University of California	Va.
Hansen, Henry B.S. in M.E. 1951, Drexel Institute of Technology	Colo.	Hennigan, Edward Thomas B.S. in Ed. 1949, Pennsylvania State Teachers College, East Stroudsburg	
Hansler, Gerald Michael B.S. in C.E., B.S. in Ind. Eng. 1956, University of Washington	N.Y.	A.M. in Ed. 1959, The George Washington University	
Harder, Paul Richard B.S. 1957, Rose Polytechnic Institute	Wash.	Henry, John Alfred A.B. 1952, Bowdoin College	Maine
Hardman, John Welch B.S. 1952, University of Maryland	Va.	Herbert, Thomas Oliver B.E.E. 1953, Catholic University of America	Va.
Harmer, John Loren B.S. 1959, University of Utah	D.C.	Herink, Laverne Dale B.S. 1952, State University of Iowa	Md.
Harmon, John Henry III A.B. 1952, Bucknell University	Utah	Herrman, George Ross B.S. 1938, Indiana University	Ind.
Harper, Ralph Everett A.B. 1956, University of Rochester	D.C.	Hersman, Marion Frank B.S. 1953, Ohio State University	Va.
	D.C.	Ph.D. 1956, University of Illinois LL.B. 1958, The George Washington University	
		Hertz, Harvey Sander B.S. in E.E. 1955, University of Colorado	Va.

Herz, Robert Richard B.S. 1951, Columbia University	Nev.	Horowitz, Eugene Gary A.B. 1958, The George Washington University	D.C.
Hessenaur, Lloyd Edward B.S. 1955, LL.B. 1957, Wayne State University	Mich.	Horton, Corwin Ray B.S. 1956, Oregon State College	Oreg. D.C.
Higson, Kenneth James A.B. 1956, McMaster University, Canada	Canada	Hosmer, Howard, Jr. A.B. 1954, Pennsylvania State University	N.Y.
Hilberg, Frank Clarence, Jr. A.B. 1956, University of Virginia	Del.	Hough, Elizabeth Ann A.B. 1957, Cornell University	Pa.
Hill, Rufus Sadler, Jr. B.S. 1957, Clemson Agricultural College	S.C.	Houston, James John B.S. 1954, University of Scranton M.B.A. 1958, The George Washington University	D.C.
Hill, Warren Dean B.S. 1955, Ohio State University	Va.	Howard, Jay William A.B. 1955, The George Washington University	Calif. Md.
Hillings, Edward Joseph A.B. 1959, University of Southern California	Calif.	Howard, John Wright B.S. 1955, Florida State University	Pa.
Hinds, William Ray B.M.E. 1956, Alabama Polytechnic Institute	S.C.	Howk, Philip Churchill A.B. 1959, College of William and Mary	N.Y.
Hinkle, James Allan B.E.E. 1957, University of Virginia	Va.	Howson, Hubert Farnham A.B. 1954, University of Massachusetts	Texas
Hoback, Karl Franklin B.S. 1950, M.S. 1951, Marshall College Ph.D. 1956, West Virginia University	Va.	Hubbard, Elbert Mickey B.S., LL.B. 1957, University of Oklahoma	Md.
Hochhauser, Stanley Manuel A.B. 1958, Brooklyn College	N.Y.	Hubbel, Carter Carol, Jr. A.B. 1959, University of Maryland	Maine
Hodes, Philip Jay A.B. 1958, Rutgers University	N.J.	Hudson, Edward Gerard B.S. 1937, Bowdoin College LL.B. 1947, LL.M. 1950, Georgetown University	Okla.
Hodgson, Albert Corveth B.S. 1957, Virginia Polytechnic Institute	Va.	Hughes, James Hope B.S. 1948, University of Oklahoma	Idaho
Hoes, Donald Allen B.S. 1954, University of Cincinnati	Va.	Hughes, Richard D. A.B. 1959, University of Idaho	D.C.
Hoffman, Drayton Ellsworth B.C.E. 1956, University of Virginia	Md.	Hull, William Jacob A.B. 1934, LL.B. 1937, Yale University	Pa.
Hoffman, John Stanley A.B. 1958, Centre College	Ky.	Humes, James Calhoun A.B. 1959, The George Washington University	Wyo.
Holcombe, John Howard B.S. in E.E. 1959, Iowa State College of Agriculture and Mechanic Arts	Ill.	Humphreys, Keith Stratford B.S. 1955, Brigham Young University	Va.
Holder, Eugene Loyce A.B. 1953, University of California at Los Angeles	Calif.	Hunter, Thomas Braden B.S. in Ch.E. 1956, Case Institute of Technology	N.Y.
Hollon, Dan Sherwin A.B. 1949, American University A.M. 1950, Columbia University	Va.	Huntington, Lawrence Smith A.B. 1957, Harvard University	Va.
Holmes, Ralph A., Jr. B.S. 1947, University of Maryland LL.B. 1950, University of Virginia	Va.	Hurst, Carl Wilson, Jr. A.B. in Govt. 1949, The George Washington University	Va.
Holt, William Harry B.S. in Eng. 1957, The George Washington University	D.C.	Husting, Stephen Steidinger B.S. in M.E. 1954, Purdue University	D.C.
Holtzer, James Anthony A.B. in Govt. 1957, The George Washington University	Pa.	Hutchison, Alan David B.S. in B.A. 1956, Ohio State University	
Honeycutt, Gary Clark B.S. 1954, University of Arkansas	Va.		I Conn.
Hood, Robert Harrison A.B. 1957, Ohio Wesleyan University	D.C.	Iannotti, Lawrence William B.S. 1952, U. S. Naval Academy	Ohio
Hoofnagle, Joseph Bruce, Jr. B.S. in E.E. 1958, Virginia Polytechnic Institute	Va.	Isakov, Peter Ch.E. 1958, University of Cincinnati	Va.
Hopkins, James W. A.B. 1956, Maryville College	Md.	Iwaskow, William Basil, Jr. B.S. in Ch.E. 1958, College of the City of New York	Hawaii
Horen, Morton Elliott A.B. 1950, West Virginia University	Md.	Izum, Francis Masayuki A.B. 1954, University of Hawaii	
Horgan, James Joseph B.S. 1957, LaSalle College	Del.		

J

Jabas, Florian Harley		Johnson, Arthur	Va.
B.S. 1957, University of Wisconsin	Wis.	A.B. 1935, University of Alabama	Va.
Jackel, Earl Howard		Johnson, Bruce Forrester	Calif.
A.B. 1959, Bard College	N.Y.	A.B. 1956, University of Southern California	
Jackson, John David		Johnson, Daniel Lynn	Md.
B.S. 1958, University of Maryland	Va.	A.B. in Govt. 1950, The George Washington University	
Jackson, Richard Kay	D.C.	Johnson, David William	N.Y.
B.S. 1957, Iowa State College of Agriculture and Mechanic Arts		B.S. 1952, Brooklyn College	
Jacob, Arthur	N.J.	LL.B. 1959, The George Washington University	
B.S. in M.E. 1954, Massachusetts Institute of Technology		Johnson, Kenneth Powell	Va.
Jacobs, Herbert William, Jr.	Ill.	B.M.E. 1950, Syracuse University	
B.S. 1949, Bradley University		Johnson, Mordecai	S.C.
Jacobs, Kenneth Elmer	W.Va.	A.B. 1951, South Carolina State College	
B.S. 1956, University of California		LL.B. 1959, Howard University	
Jacobs, Marvin Eugene	Va.	Johnson, Raymond Eric	N.Y.
B.S. 1959, Drexel Institute of Technology		B.C.E. 1958, Rensselaer Polytechnic Institute	
Jacobsen, Bernice Harriet	D.C.	Johnson, Robert Alfred	D.C.
Ed.B. 1947, Wisconsin State College, River Falls		B.S. 1950, Ohio State University	
A.M. in Govt. 1954, The George Washington University		M.S. 1956, Colorado School of Mines	Ill.
Jager, Elizabeth Rodgers	D.C.	Johnson, Rodger Allyn	
A.B. 1945, Smith College		B.S. in E.E. 1957, University of Illinois	Md.
Jager, Bruce Anderson	Wyo.	Johnson, Vernon Webster, Jr.	
B.S. in Ch.E. 1957, University of New Mexico		A.B. 1956, Duke University	Va.
Jakobson, Richard Julius	Tenn.	Johnston, Ervin Frederic	
A.B. 1958, The George Washington University		B.S. in C.E. 1952, LL.B. 1958, University of Arizona	
James, Donald Richard	Va.	Johnston William David	Md.
A.B. 1956, Seton Hall University		A.B. 1958, Lafayette College	
James, Edith Lee	D.C.	Jones, Alon Rodell	Md.
B.S. 1949, The George Washington University		A.B. 1951, Temple University	
James, Jerry Preston	D.C.	Jones, Charles Sherfy	Md.
A.B. 1958 Phillips University		B.S. in C.E. 1953, Duke University	
Janzam, Harold Dudley	D.C.	Jones, Harry Chapman III	Va.
B.S. 1957, South Dakota State College of Agriculture and Mechanic Arts	S.D.	B.S. 1957, Yale University	
Jeffery, Donald Dyer	Va.	Jones, Clinton Mead, Jr.	Va.
B.S. 1957, University of Wisconsin		B.S. in M.E. 1959, Virginia Polytechnic Institute	Pa.
Jeffery, Joseph Daniel	Colo.	Jones, David DeBellis	
B.S. in E.E. 1941, U. S. Naval Academy		A.B. 1958, Pennsylvania State University	Ark.
M.S. in M.E. 1951, Rensselaer Polytechnic Institute	Ohio	Jones, John Norvill	
Jeffery, Peter		A.B. in Govt. 1956, The George Washington University	N.Y.
B.S. in B.A. 1955, Ohio State University	Ill.	Jones, Murray Edwin	
Jenkins, David Meredith		B.S. 1952, Central State College	Kans.
A.B. 1958, DePauw University	Md.	Jordan, Gary Lynn	
Jenkins, Donn Keyes		B.S. in Ch.E. 1958, University of Kansas	Md.
B.M.E. 1946, University of Virginia	Va.	Jordan, Phil Winburn	
Jenkins, John Smith		B.S.C. 1935, University of Georgia	N.Y.
A.B. 1954, Lafayette College	Va.	Joyce, James Gerard	
Jennings, Charles Henry III		B.M.E. 1957, Villanova University	Maine
A.B. 1951, University of Pittsburgh		Joyce, Kevin Edward	
M.S. 1952, University of Denver	Ariz.	B.S. in E.E. 1956, Worcester Polytechnic Institute	Utah
Jennings, Curtis Arthur	Fla.	Judd, Evan Vernel	
A.B. 1956, University of Arizona		B.S. 1956, Brigham Young University	
B.S. in E.E. 1954, University of Miami			
Jensen, James Michael		K	
B.S. 1950, State University of Iowa		Kabrich, Delmar, Jr.	Va.
Jorgensen, Keith E.	Idaho	A.B. in Govt. 1955, The George Washington University	
LL.B. 1955, University of Idaho		Kahn, Stuart	N.J.
LL.M. 1956, Columbia University	Ind.	A.B. 1957, Indiana University	
Johannsmeyer, Walter Frederick		Kannee, Bruce Neal	Md.
B.S. 1956, Rose Polytechnic Institute		A.B. 1957, The George Washington University	

Kaplan, Charles Marvin B.S. 1953, Massachusetts Institute of Technology	Tenn.	Kirkpatrick, Thomas Healy B.S. 1958, University of Oregon	D.C.
Karp, Arnold Lewis A.B. 1954, University of Maryland	Md.	Klaas, Bruce Gregory B.S. in M.E., B.S. in B.A. 1956, University of Colorado	Va.
Kastriner, Lawrence George A.B. 1954, B.S. 1955, M.S. 1959, Columbia University	Va.	Klauber, Stefan Jay A.B. 1955, Cornell University	Md.
Katz, Sylvan L. B.S. 1943, University of Maryland	D.C.	Kleeman, Werner Warren B.S. in M.E. 1956, University of Michigan	Va.
Kauffman, Roscoe Craig B.S. 1958, Pennsylvania State University	Pa.	Kleffen, James Elmer A.B. 1952, University of Chicago	D.C.
Kaul, Donald Allen B.M.E. 1958, Ohio State University	Ohio	Klinefelter, George Robert A.B. 1959, University of Utah	Utah
Kay, Alan A.B. 1957, The George Washington University	Va.	Klooz, Marie Stuart A.B. 1923, Sweet Briar College	D.C.
Kaye Harvey B.S. in T.E. 1956, Lowell Institute of Technology	Va.	Klus, John Peter B.S. 1957, Michigan College of Mining and Technology	Wa.
Keire, Fred Aivars B.S. in Ch.E. 1957, University of Washington	Wash.	Knowles, Allen Nordmark B.S. 1955, State University of Iowa	Va.
Keiser, Clarence Cyrus, Jr. A.B. 1954, University of the South	Md.	Koch, John Arthur B.I.E. 1954, Ohio State University	D.C.
Keller, Samuel William B.S. 1955, University of Maryland	D.C.	Koeng, Carl Stuart B.S. 1959, Rensselaer Polytechnic Institute	N.Y.
Kemmel, William Anthony, Jr. B.S. 1952, M.S. 1953, California Institute of Technology	Va.	Kohl, Donald Phillip A.B. 1955, Ohio State University	Va.
Kempl, Robert Frederick B.S. in E.E. 1952, University of Massachusetts	Va.	Kohn, Janet Goldrich A.B. 1951, Antioch College	D.C.
Kennedy, John Edward, Jr. A.B. 1947, Boston College	Va.	Kondrocki, Edward John B.S. in E.E. 1959, Newark College of Engineering	Va.
Kenney, Joseph Ernest B.S. in M.E. 1956, University of Massachusetts	Va.	Koutras, George Anest A.B. 1954, The George Washington University	Va.
Kennington, Charles Robert B.S. 1949, Kent State University	Ohio	Kovac, Michael B.S. in I.E. 1959, Washington University	Va.
Kesten, Sanford Miller A.B. 1957, University of Michigan	Mich.	Kovell, Stanley Paul B.S. 1955, Northeastern University	Va.
Ketch, Clair Vrooman B.S. 1954, University of Utah	N.Y.	Kovelman, Gilbert Gerald B.E.E. 1956, Cooper Union	Md.
Ketcham, John Tyden A.B. in Govt. 1958, The George Washington University	Va.	Kovin, John Fred A.B. 1958, Washington Missionary College	Va.
Kidida, Bernard George B.S. 1958, Pennsylvania State University	Pa.	Kowalczyk, Chester Harry B.S. in E.M. 1956, West Virginia University	Md.
Kiely, JoAnne Marie A.B. 1956, Albertus Magnus College	Conn.	Kratchman, Jack B.S. 1948, College of the City of New York	N.Y.
Kilcoyne, Patrick Emmett B.S. 1948, Louisiana State University	D.C.	Krawiec, Martin B.S. 1958, Cornell University	D.C.
Kim, Hee Nam LL.B. 1958, Loyola University	Korea	Krebs, Henry Charles A.B. in Govt. 1949, The George Washington University	Md.
Kim, John Jaihyun B.S. 1959, D.C. Teachers College	D.C.	Kreh, Henry George B.S. 1950, Yale University	India
King George William B.S. in M.E. 1957, West Virginia University	Va.	Krishna, Somonahally Malliah A.B. 1952, Maharaja's College, India	N.J.
King, William Houston B.S. in E.E. 1950, University of Kentucky	Va.	LL.B. 1955, Bangalore Government Law School, India	D.C.
Kinney, Sheldon Hoard B.S. 1941, U.S. Naval Academy	Calif.	M.C.L. 1959, Southern Methodist University	Mich.
Kinsella, Richard B.S. in F.S. 1955, Georgetown University	Conn.	Krohn, Jenny A.B. 1958, Hood College	
Kirchman, Charles Vincent A.B. 1959, University of Maryland	D.C.	Kruger, Walter B.S. in M.E. 1956, Lafayette College	
		Kubani, Thomas Leo B.M.E. 1954, General Motors Institute	

Kuch, Bailin Lewis B.S. 1951, Brooklyn Polytechnic Institute	N.Y.	LeBaron, Edward Wayne, Jr. A.B. 1950, College of the Pacific	Calif.
Kunitz, Norman Nathan B.S. in E.E. 1957, Drexel Institute of Technology	Pa.	Ledbetter, Julia Elizabeth A.B. in Ed. 1944, The George Washington University	D.C.
Kurth, Donald Meredith A.B. 1955, Dartmouth College	Md.	Lee, James Bracken B.S. 1952, U. S. Military Academy	Utah
Kurtz, Richard Everett B.S. 1955, Lehigh University	Pa.	Leiner, Charles Philip B.S. in M.E. 1951, San Diego State College	Md.
Kushnick, Michael Gordon A.B. 1955, Colgate University	Pa.	Lemert, James Edwin B.S. in E.E. 1957, Purdue University	Ohio
LL.B. 1958, Columbia University		Lenkin, Ronald Louis A.B. 1959, The George Washington University	D.C.
Kusulos, Harold Andrews A.B. 1949, University of Washington	Wash.	Leon, Bernard Samuel A.B. 1951, New York University	N.Y.
L			
LaBonte, Clarence Victor A.B. 1958, Cornell University	Mass.	Lepchinsky, Charles Richard B.E.E. 1957, The George Washington University	Pa.
Labowski, Joseph B.S. 1956, Pennsylvania State University	Pa.	Lerch, Harry Walter A.B. 1959, Wesleyan University	Md.
Lack, James Harold B.S. 1955, Iowa State College of Agriculture and Mechanical Arts	Md.	Leslie, David Ellis B.S. 1957, California State Polytechnic College	Calif.
Lakes, Cecil Thomas A.B. 1948, LL.B. 1950, University of Cincinnati	Ohio	Lesmes, George Franklin B.S. 1955, College of the City of New York	N.Y.
Lamb, Owen Lester B.E.E. 1956, Rensselaer Polytechnic Institute	N.Y.	Lester, James Dudley A.B. 1957, East Central State College	Okla.
Lamphere, George Elwood B.S. 1952, Haverford College	Md.	Levine, Aaron M. A.B. 1958, Brooklyn College	D.C.
B.S. in Bldg. Eng. and Construction 1954, Massachusetts Institute of Technology		Levine, Herbert B.S. 1948, Brooklyn College	D.C.
Landberg, Erik Wilgus A.B. 1955, Cornell University	N.Y.	Levinson, Alan Marvin A.B. 1955, Cornell University	Va.
Landstrom, Karl Sigurd A.B. 1930, A.M. 1932, University of Oregon	Va.	Levinson, Daniel Richard A.B. 1953, New York University	D.C.
Lane, Anthony Thomas B.E.E. 1957, The George Washington University	Va.	Levison, Floyd Stern B.S. 1957, U. S. Merchant Marine Academy	Va.
Lane, Helen Scrymgeour A.B. 1928, University of Michigan	Va.	Levitt, Julian S. B.S. 1951, College of the City of New York	D.C.
Lang, William Adams A.B. in Govt. 1954, The George Washington University	Va.	M.S. 1953, Kansas State College of Agriculture and Applied Science	
Langston, Jay Calvin, Jr. B.S. 1957, Montana State University	Va.	Levitsky, Maria B.M.L. 1939, University of Tartu, Estonia	D.C.
LePrade, John Christian B.S. 1957, New Mexico College of Agricultural and Mechanical Arts	D.C.	Levy, Earl B.E.E. 1952, Rensselaer Polytechnic Institute	Va.
Larcker, Earl Lynn A.B. 1957, Utah State University of Agriculture and Applied Science	Va.	Lewis, Eric Karl A.B. 1955, University of Rochester	Del.
Laron, Sturges Nicholas A.B. 1959, Franklin and Marshall College	Utah	Lewis, James Thomas A.B. 1953, Randolph-Macon College	Md.
Larson, John Monk A.B. 1958, Washington and Lee University	Conn.	Lewis, Robert Eugene A.B. 1956, University of Chattanooga	D.C.
LaRue, Adrian John B.S. 1956, Virginia Polytechnic Institute	D.C.	Lewis, Samuel Harris A.B. 1959, Cornell University	Del.
Lauck, Robert Gerald A.B. 1949, University of Wichita	Md.	Lias, Thomas Lee A.B. 1956, State University of Iowa	Iowa
LL.B. 1954, University of Kansas		Liljenquist, Lorenzo Blaine B.S. 1938, University of Idaho	Va.
Lawrence, James D'Edwine A.B. 1955, University of Delaware	Kans.	Lindrooth, Charles Hutchinson B.S. 1956, University of Illinois	Ill.
Lawson, Julian Paul A.B. 1954, University of Maryland	Va.	Lione, Richard Guy B.S. 1954, University of Wisconsin	Wis.
	Md.	Lipnick, Stanley Melvin A.B. 1956, Columbia University	D.C.
		Lipson, Roger Russell A.B. 1958, Boston University	Mass.

Lochte, Albert Joseph, Jr. B.S. 1957, University of Maryland	Md.	Malone, Dana Bradford A.B. 1938, Harvard University	Mass.
Loepp, Marie Therese A.B. 1951, State University of Iowa	Iowa	Malonis, Edward Joseph A.B. 1952, Dartmouth College	Mass.
Long, Robert Eugene A.B. 1953, Indiana University	D.C.	Malossi, Leo Italo A.M. 1953, Tufts University	N.Y.
Loomis, Wilhelmina Tortike A.B. in Govt. 1954, The George Washington University	Va.	Malossi, Leo Italo B.C.E. 1947, Rensselaer Polytechnic Institute	Md.
Love, James William B.A.E. 1950, Catholic University of America	Va.	Malzone, Francis Richard B.S. in Phar. 1953, The George Washington University	Iowa
Lowe, Allan Mathew B.S. 1956, University of Maryland	D.C.	Manatt, Charles Taylor B.S. 1958, State University of Iowa	Iowa
Lu, Jose Soriano LL.B. 1956, University of the Philippines	Philippines	Manning, John Raymond B.S. in Eng. 1957, The George Washington University	Nev.
Lubitz, Stuart B.I.E. 1957, B.M.E. 1958, University of Florida	Fla.	Manoukian, Milton A.B. 1957, University of Nevada	Md.
Luckhardt, Philip George B.S. 1956, Columbia University	N.Y.	Mans, Mitchell Charles B.S. in E.E. 1951, Evansville College	Va.
Luellman, Charles Gailord A.B. 1952, LL.B. 1958, University of Nebraska	Nebr.	Mansur, Jean B.S. 1946, University of Kansas	Va.
Lutter, Frank William B.S. 1949, University of California	D.C.	Marbert, James Benjamin B.S. in C.E. 1957, Clemson Agricultural College	D.C.
Lyne, Robert Chamberlayne, Jr. B.S. 1958, University of North Carolina	Va.	Marcks, Alfred Richard, Jr. A.B. 1953, Gettysburg College	Nev.
M			
MacAlpine, Kenneth Dedrick A.B. 1955, Lafayette College	N.J.	M.S. 1957, Columbia University	Pa.
Macielinski, Adam Maria LL.M. 1931, M.Pol.Sc. 1934, University of Lwow, Poland	D.C.	Marfisi, Philip Michael A.B. 1957, University of Nevada	Pa.
Mackey, Leon Gene A.B. 1957, University of Utah	Utah	Margolis, Lawrence Stanley B.S. in M.E. 1957, Drexel Institute of Technology	Conn.
Mackiewicz, John Jacob B.S. in Ch.E. 1951, Yale University	D.C.	Marinaccio, Charles Lindberg A.B. 1957, University of Connecticut	Md.
MacMillan, Dalphine A.B. 1939, Cornell University	Pa.	Marlo, George Joseph B.S. in I.E. 1956, Pennsylvania State University	Va.
MacNaughton, Marcia Jean A.B. 1956, Barnard College	Va.	Marlow, Charles Austin, Jr. A.B. 1953, The George Washington University	Md.
Madden, Richard Leo B.S. 1956, Indiana University	Va.	Marmar, Melvin Edward B.S. in Ed. 1955, M.B.A. 1957, University of Maryland	Wis.
Maddox, Ronald Paul A.B. 1952, Swarthmore College	Va.	Marquardt, Merritt Reno B.S. 1956, University of Wisconsin	Va.
Madsen, Lowell Leroy B.S. 1954, Brigham Young University	Va.	Marrero, Robert A.B. 1958, The George Washington University	Va.
Magruder, June Overton B.S. 1949, University of Maryland	Utah	Marsh, Luther Arnold A.B. 1951, University of North Carolina	N.Y.
Mahon, Frank May B.S. 1952, M.S. 1955, North Texas State College	D.C.	Marston, Donn Richard A.B. 1956, Harvard University	N.C.
Maier, John Boniface B.S. in Ch.E. 1957, University of Rochester	Texas	Martin, James Edwin, Jr. A.B. 1957, University of North Carolina	Vt.
Main, Philip David A.B. 1958, Bates College	N.Y.	Martin, Stephen Briggs A.B. 1954, Wesleyan University	Va.
Makl, Allan Osmo B.S. in Ch.E. 1959, University of Wisconsin	Conn.	Martine, Chester Earl, Jr. B.M.E. 1958, Rensselaer Polytechnic Institute	Wash.
Makris, James Leonard B.S. 1958, University of New Hampshire	Wis.	Martinsen, John Harold A.B. 1949, Gonzaga University	Va.
Malley, John Cyril B.S. 1953, Roosevelt University	N.H.	B.S. in F.S. 1952, Georgetown University	Va.
J.D. 1958, Northwestern University	Va.	Maska, Edwin Chester B.S. 1953, University of Pennsylvania	Va.
Mallios, Dimitri Peter A.B. in Govt. 1954, The George Washington University	D.C.	Matthews, Samuel Sheridan B.S. 1955, The George Washington University	

Matthews, William Alexander A.B. in Govt. 1956, The George Washington University	Pa.	McKenzie, Michael Edward A.B. 1959, Dartmouth College	Va.
Matzureff, George Dimitroff A.B. 1954, University of Illinois	Md.	McLaughlin, Joseph Donald LL.B. 1941, National University	D.C.
Mautner, Sanford Richard B.S. in B.A. 1951, Georgetown University	Va.	McNamara, Thomas Neal A.B. 1952, Duke University	Va.
Mautz, George Francis B.C.E. 1957, Villanova University	Pa.	McNeely, Gibbon Elliott B.S. 1950, University of North Carolina	Va.
May, Edgar Burton A.B. 1952, A.M. 1953, University of Buffalo	D.C.	McNenny, James Hunter A.B. 1956, Miami University	Ohio
Mayer, Jacob William B.S. 1954, LL.B. 1957, University of Kentucky	Va.	Means, Cecil Paul A.B. 1957, University of Nebraska	Va.
LL.M. 1958, The George Washington University		Mehr, Milton Samuel B.C.E. 1951, Rensselaer Polytechnic Institute	D.C.
McAuliffe, Francis Adam B.S. 1957, University of Maryland	Md.	Meller, Michael Nicholas B.Ch.E. 1957, Pratt Institute	Va.
McCandlish, Harrison Eugene B.M.E. 1952, Polytechnic Institute of Brooklyn	D.C.	Mencher, Bruce Stephan A.B. in Govt. 1957, The George Washington University	D.C.
McCarthy, James Francis A.B. 1956, Boston University	D.C.	Mentis, George Alexander B.S. 1947, Loyola College	Md.
McClafferty, Lawrence Benedict A.B. 1957, Muhlenberg College	Md.	Meros, Edward John B.S. 1953, Pennsylvania State University	Pa.
McClelland, Charles Irvin B.S. 1955, Virginia Military Institute	Va.	Meyer, Joseph Thomas B.B.A. 1957, University of Miami	Fla.
McClendon, Frank Lemuel, Jr. B.S. 1958, University of Texas	Texas	Meyers, Albert Temin B.S. 1951, University of Maryland	Md.
McConnell, Terry James B.S. 1957, Tennessee Polytechnic Institute	D.C.	Meyers, Hugh Truman A.B. in Govt. 1951, The George Washington University	Va.
McCormack, John Joseph B.S. 1954, Boston College	D.C.	Mich, Alex. Jr. B.S. in Ch.E., B.S. in Met.E. 1949, University of Michigan	Mich.
McCormick, James Carlos A.B. 1958, University of Arizona	Md.	Michaels, Stanley A.B. 1950, Cornell University	N.Y.
McDaniel, Robert Bruce, Jr. A.B. 1954, Emory University	Ariz.	Mikesell, William Alexander, Jr. B.S. in Ch.E. 1953, Pennsylvania State University	Va.
McDermott, Edwin Floyd A.B. 1951, Denison University	Va.	Miles, Tim Richard B.E. 1959, Vanderbilt University	D.C.
McDermott, Patricia Louise A.B. 1958, Idaho State College	Ohio	Millard, James Judson B.S. 1953, Georgetown University	Va.
McDonnell, Robert John B.S. in M.E. 1958, Drexel Institute of Technology	Idaho	Miller, Burdsall Dunham B.S. 1945, Albright College	Pa.
McDowell, William Woods, Jr. B.E. 1953, Johns Hopkins University	Pa.	Miller, Harvey Gerald M.S. 1952, Ohio State University	Va.
McElwaine, Matthew Kenneth A.B. 1954, Thiel College	Md.	Miller, John Franklin A.M. 1952, University of Wisconsin	Va.
McEniry, Mary Alice B.S. 1942, University of Alabama	Va.	Miller, Robert Jay B.E.E. 1955, University of Florida	D.C.
McFady, Blake Hopper A.B. 1949, Yale University	Va.	Miller, Ronald Jack A.B. 1958, The Citadel	N.Y.
McGhee, Travis Shaw B.S. 1956, Texas College of Arts and Industry	Md.	Miller, Roy B.S. in M.E. 1956, University of Washington	D.C.
McGrath, Thomas Michael A.B. 1959, The George Washington University	Va.	Miller, Stanton Sylvester B.S. 1953, University of Maryland	Md.
McIntosh, David Foreman, Jr. B.S. 1952, U. S. Coast Guard Academy	Pa.	Miller, Stephen A.B. 1959, Michigan State University	Mass.
McIntosh, James Albert B.S. 1955, U. S. Military Academy	Idaho	Milstead, Jerry Bennett B.S. in E.E. 1957, Virginia Polytechnic Institute	Va.
McKay, Cameron Lawrence B.S. 1955, University of Maryland	Md.	Miner, Newton Arthur A.B. 1952, The George Washington University	Pa.
McKee, Douglas Robert B.M.E. 1953, Rensselaer Polytechnic Institute	D.C.		
McKee, James Joseph B.S. 1950, Fordham University	N.Y.		

Mitchell, Charles Reese	Ala.	Morrison, Herbert Dean	Idaho
B.S. 1951, University of Alabama		A.B. 1955, Principia College	Va.
Mitchell, George Charles	D.C.	Morse, Wayne Allen, Jr.	
B.S. 1941, Nebraska State Teachers College, Kearney		B.S. in Bus. 1948, University of Kansas	
A.M. 1947, Georgetown University		B.S. in Ed. 1949, Kansas State Teachers College, Emporia	
Ph.D. 1959, University of Paris, France	Va.	Moss, Reed L.	Va.
Mitchell, George Joseph, Jr.		A.B. 1957, Brigham Young University	
B.S. 1954, Massachusetts Maritime Academy		Moss, Thayer David	D.C.
B.S. in F.S. 1958, Georgetown University	W.Va.	B.S. in Ed. 1937, Bucknell University	
Mitchell, John Riley		LL.B. 1950, Georgetown University	Md.
A.B. 1958, West Virginia University	Md.	Mossinghoff, Gerald Joseph	Va.
Mitchell, Robert Laurie		B.S. in E.E. 1957, St. Louis University	
A.B. 1949, University of Maryland		Mostwin-Stanislaw, Edward	
LL.B. 1954, Emory University	N.Y.	M.L.L. 1945, University of Warsaw	
Mitchell, Roy Shaw		Motsko, Donald Russell	D.C.
B.S. 1957, Cornell University	Nebr.	B.S. 1957, Pennsylvania State University	
Moeller, Charles James		Moucha, Louis Anton	
A.B. 1954, Nebraska Wesleyan University	Md.	B.S. in E.E. 1950, University of Connecticut	S.D.
Molitch, Matthew		M.S. in E.E. 1952, Lehigh University	D.C.
B.S. 1957, New York University	Va.	Moulton, Rodney Freeman	
Monahan, Thomas Hugh	Calif.	A.B. 1949, University of South Dakota	
B.S. 1956, College of William and Mary		Muhlenberg, David Stoddard	Ill.
Mondschein, Earl Jay		A.B. 1951, Williams College	
A.B. 1951, The George Washington University	Va.	B.S. 1952, Massachusetts Institute of Technology	D.C.
Montgomery, Robert Hayes		Mulholland, John Herbert	
B.E.E. 1954, The George Washington University	Va.	B.S. 1957, University of Illinois	Va.
Moody, Clifford Johnson		Mullally, John Joseph	Mass.
A.B. 1958, University of New Hampshire	Va.	B.S. 1953, Georgetown University	
Moon, Sang IK	Korea	Mullins, George Gordon	
LL.B. 1954, Seoul National University, Korea		A.B. 1945, Hamline University	D.C.
Moore, Gerald Lee	Md.	Mullins, John Joseph, Jr.	
B.S. in E.E. 1953, Rose Polytechnic Institute		B.S. in C.E. 1956, University of Connecticut	Colo.
Moore, James Stewart	D.C.	Mulroney, Michael John	
B.S. 1959, University of Maryland	Texas	A.B. 1959, State University of Iowa	
Moore, John Curtis		Multer, Richard Duane	Va.
A.B. 1954, University of Texas	Va.	B.S. in M.E. 1956, University of Colorado	Wash.
Moore, Robert Eugene	N.H.	Munnis, David Verne	
B.S. 1957, University of South Dakota		B.S. 1959, University of Illinois	Va.
Moran, Winnifred Mary		Munro, Sanford Sterling	
B.S. 1940, University of New Hampshire	Md.	A.B. 1957, The George Washington University	
Morgan, Eleanor Humphrey		Murphy, Joseph Patrick	Md.
A.B. 1956, Oberlin College	Va.	A.B. 1949, LL.B. 1950, LL.M. 1952, The George Washington University	
Moriarty, Patrick J.		Murray, James Glick	
A.B. 1950, American International College	Mass.	B.S. in M.E. 1948, University of Maryland	N.J.
A.M. 1951, University of Minnesota		M.S. in M.E. 1952, University of Washington	D.C.
Moriarty, Paul Maurice	Md.	B.E.E. 1956, The George Washington University	
A.B. 1942, Columbia University		Murray, Jeremiah Gerard	
Morin, Armand Girard		B.S. 1957, Newark College of Engineering	N.Y.
B.S. 1939, University of New Hampshire	Va.	Murray, John Patrick	
Moring, John Frederick	Scotland	B.S. in F.S. 1957, Georgetown University	D.C.
B.S. in I.E. 1957, Virginia Polytechnic Institute		Musumeci, Alfred Vincent	
Morris, George Gregg		B.M.E. 1956, Rensselaer Polytechnic Institute	
B.L. 1959, Glasgow University, Scotland	Pa.	Myer, Daniel Kurtz	Md.
Morris, John Michael	D.C.	B.E.E. 1954, Georgia Institute of Technology	D.C.
Morris, Jonas Van Wie		Myers, John Faris	
A.B. 1955, Hobart and William Smith Colleges	N.M.	B.S. 1954, University of Maryland	
Morris, Ronald David		Myles, Vale Patrick	
B.S. in Ch.E. 1955, University of Tennessee		B.S. in E.E. 1953, University of Nevada	

N

Naftalin, Micah Harry
A.B. 1955, Brandeis University
Naftalin, Mortimer Lewis
A.B. 1946, B.S. 1947, A.M. 1950,
University of Minnesota
Naranch, Rudolph Norman, Jr.
B.S. 1954, West Liberty State College
Natalie, Ronald Bruce
A.B. 1957, Tufts University
Natsman, Gary M.
B.S.C. 1959, Ohio University
Nathanson, James Elzar
A.B. 1954, Harvard University
Neal, Philip Stanley
A.B. 1954, University of Colorado
Neal, William Albert
A.B. 1956, University of Maryland
Neal, William Mills, Jr.
A.B. 1958, University of Alabama
Neodeman, Irving
B.M.E. 1958, Rensselaer Polytechnic
Institute
Nef, Edward Victor
A.B. 1955, Harvard University
Neilan, George Joseph
B.E. 1957, Yale University
Nemark, Sheridan Lew
B.S. in Ch.E. 1957, Carnegie Institute
of Technology
Nelson, John William
A.B. 1955, A.M. 1954, Tufts
University
Nelson, Julia Ney
A.B. 1944, University of California
Newman, Arthur Ewald
B.S. 1950, Memphis State College
LL.B. 1955, The George Washington
University
Newbould, Edmond John
B.S. 1940, U. S. Naval Academy
Newcom, Brennan John
B.S. 1959, University of San Francisco
Ney, Wilbert Roger
B.S. 1957, Yale University
Nichol, Gerald Charles
A.B. 1957, University of Michigan
Nichols, Charles Robert
A.B. 1958, University of New Mexico
Nichols, Charles Sidney, Jr.
A.B., A.M. 1956, University of Nevada
Numeroff, Bertram
B.E.E. 1942, College of the City of
New York
Nutz, Henry Masao
A.B. 1953, University of Hawaii
Nuzo, William Lynn
B.S. 1958, Brigham Young University
Nordberg, Carl Alfred
A.B. 1957, University of Michigan
Nordstrom, John Ranco
A.B. 1949, Minnesota State Teachers
College, Moorhead
A.M. 1958, University of Minnesota
Norrell, Julia Jean
A.B. 1957, Ohio Wesleyan University
Noyes, Henry Joseph
B.S. 1951, University of Maryland
Nuzzo, Nicholas Stephen
A.B. in Govt. 1957, The George
Washington University

Nypaver, Edward William
B.S. in C.E. 1957, University of
Pittsburgh
O
Oakes, Thomas Burrett
A.B. 1956, Yale University
Oberhauser, Louis B. II
B.S. in C.E. 1956, State University of
Iowa
O'Briant, Robert Earl
B.S. 1955, University of Maryland
O'Brien, Anna Belle
A.B. 1934, Smith College
A.M. 1936, Cambridge University,
England
O'Brien, James David
B.S. 1953, Georgetown University
O'Connor, Dennis Edward Watson
B.S. 1952, U. S. Naval Academy
Oddi, Archie Samuel
B.S. 1958, Carnegie Institute of
Technology
Odin, Dexter Stetson
B.S. 1956, University of Florida
Ohl, Robert Stephen
A.B. 1959, Hobart College
Olexa, Donald Steen
B.S. in Ch.E. 1956, Pennsylvania State
University
Oleyar, George Louis
B.S. 1951, Georgetown University
Olsen, Dennis M.
B.S. 1957, Brigham Young University
Olson, Gordon Harold
B.S. 1955, North Dakota Agricultural
College
Olson, Robert Leo
B.S. in Gen. Eng. 1956, South Dakota
School of Mines and Technology
Opdyke, Robert Dale
A.B. 1957, Western Michigan College
O'Rourke, Francis James
B.S. 1955, Northeastern University
O'Toole, Ursula Elizabeth
B.S. 1954, Loyola University, Ill.
Ottenstein, Alurence Alan
A.B. 1959, University of Maryland
Otto, Donald Lane
B.S. 1959, State University of Iowa
P
Pagano, Joseph F.
A.B. 1952, Niagara University
Page, Robert Eugene
A.B. 1958, Illinois Wesleyan
University
Painter, Robert Kessler
B.S. 1953, University of Illinois
Paintin, Francis Arthur
B.S. in Ch.E. 1951, Case Institute of
Technology
Palmer, Arthur Irving, Jr.
B.S. 1949, Yale University
M.A.M. 1956, University of Virginia
Panzitta, Frank Ralph
A.B. 1957, The George Washington
University
Pappas, John Tom
B.S. 1959, Northwestern University

Pa.

O

Va.

Iowa

Va.

Ind.

Mass.

Hawaii

Pa.

Va.

N.Y.

Va.

Va.

Idaho

Va.

Va.

Md.

Mass.

Mich.

Md.

Iowa

P

N.J.

Ill.

Md.

Ohio

Va.

N.J.

Ill.

Park, Keh Soo	Mass.	Phillips, Gabriel	Pa.
A.B. 1959, Alfred University		B.S. 1956, University of Maryland	N.C.
Parker, Gayle	Va.	Phillips, Jack Ewart	Ark.
B.S. in I.E. 1956, Lafayette College		A.B. 1955, University of North Carolina	
Parker, Sheldon Harold	Va.	Phillips, Joe Weldon	D.C.
B.S. in Ch.E. 1957, College of the City of New York		B.S. 1956, Arkansas State Teachers College	Ga.
Parlante, Joseph Lucius	D.C.	Phillips, Leland Horace	
B.S. 1957, Georgetown University		B.S. 1959, Stetson University	D.C.
Partee, Woodie Augustus, Jr.	D.C.	Phillips, Thomas Madison	
A.B. 1943, University of Georgia		B.E.E. 1952, Georgia Institute of Technology	Va.
Patten, James Ansley	Va.	Pierce, Ellsworth Thomas	Va.
A.B., B.S. 1952, American University		A.B. 1956, Northwestern University	Va.
Paul, Alan Gilbert	Va.	Pierce, Samuel, Jr.	Va.
B.M.E. 1956, Rensselaer Polytechnic Institute		B.S. 1934, University of Vermont	Va.
Pavlick, Walter Eugene	Va.	Pinkstaff, Robert Steven	
B.S. 1956, Case Institute of Technology		B.S. 1959, State University of Iowa	
Pawlick, John Edward	D.C.	Pittman, Robert Julian	Va.
B.S. 1952, University of New Hampshire		A.B. in Govt. 1950, The George Washington University	
Payne, Albert Alford	Texas	Platt, Michael Terry	Md.
A.B. 1942, The George Washington University		B.E.E. 1957, Rensselaer Polytechnic Institute	Del.
Peck, Paul Arthur	Mich.	Pledger, Reginald Harrison, Jr.	
B.S. 1958, Northwestern University		A.B. 1955, Duke University	Va.
Peckham, Alan Embree	D.C.	Plumley, Allan Rudolph, Jr.	
A.B. 1953, Earlham College		A.B. in Govt. 1959, The George Washington University	D.C.
M.S. 1955, University of Nebraska	Miss.	Poffenberger, John Dwight	
Peeples, Ralph Lawrence		B.I.E. 1957, Ohio State University	D.C.
A.B. 1957, University of Mississippi	Wis.	Polach, Jaroslav George	
Peltin, Sherwin Carl		Law Degree 1958, Masaryk University, Czechoslovakia	D.C.
B.B.A. 1950, L.L.B. 1952, University of Wisconsin		Poltz, James Charles	Va.
LL.M. 1955, New York University	Ill.	B.S. in Eng. 1958, The George Washington University	
Peltzer, Vernon Amos		Pollack, David	Va.
J.D. 1953, The George Washington University	D.C.	B.S. in A.E. 1956, University of Miami	
Perchick, Manuel		Pollack, Morris Irwin	Md.
B.B.A. 1957, University of Miami	Va.	B.S. in M.E. 1954, Newark College of Engineering	Va.
Perko, Robert R.	Pa.	Polsby, Allen Isaac	
B.S. in F.S. 1950, Georgetown University		A.B. 1959, Brown University	Va.
Perry, Charles Lynam	Va.	Porter, Parnell Jearl, Jr.	
A.B. 1959, Bethany College		A.B. 1958, University of Pittsburgh	Va.
Perry, Stanley Durward		Posin, Jack	
A.B. 1955, The George Washington University	Wash.	B.MarineE. 1951, New York State Maritime College	Va.
Perry, Thomas Calvin	D.C.	Posta, John Joseph, Jr.	
B.S. 1956, University of Portland		B.S. in Eng. 1957, The George Washington University	R.I.
Perry, William Dial	D.C.	Potter, Holbrook Louis	
A.B. 1953, Princeton University		A.B. in Govt. 1951, The George Washington University	Ill.
Peters, Richard	Va.	Pournaras, Stephen William	Ohio
B.S. 1947, University of Pennsylvania		A.B. 1942, Brown University	
Peterson, Bennett Pulley	Idaho	M.S. 1951, New York University	S.C.
B.S. 1950, University of Utah		Powers, George Richard	
Peterson, Robert Frederick	Va.	B.S. 1957, University of Illinois	
A.B. 1954, University of Idaho		Preston, Kenneth George, Jr.	
Peterson, Thomas Lee	Wis.	B.I.E. 1959, Ohio State University	
B.S. 1956, Stanford University		Price, Robert Morris	Va.
Petrusek, Robert Allen	Va.	A.B. 1950, University of South Carolina	Va.
B.S. 1954, University of Wisconsin		Price, William Isaac	D.C.
Petako, John	D.C.	B.S. 1957, Marshall College	
A.B. in Govt. 1949, The George Washington University		Prichard, Donald Lee	
M.S. 1950, Columbia University	Pa.	A.B. in Govt. 1957, The George Washington University	
Petterson, David Stovel		Priddy, Robert Ralph	
A.B. 1954, College of Wooster		B.S. 1958, Principia College	
Pezner, Harold	Md.		
B.S. 1958, Pennsylvania State University			
Pfeiffer, Richard McFarland			
A.B. 1949, University of Pittsburgh			

Provost, Nancy Lou A.B. 1956, Brown University	Conn.	Reich, Lawrence A.B. 1957, University of Arkansas	N.Y.
Pruden, Kenneth Elmer B.S. 1951, U. S. Naval Academy	Md.	Reich, Marvin B.S. 1953, Polytechnic Institute of Brooklyn	Md.
Putnam, Earle Westgate A.B. 1950, Dartmouth College	Va.	Reilly, James Donald B.S. 1954, Franklin and Marshall College	Va.
J.D. 1958, The George Washington University			
Pyatt, Nancy B.S. 1950, St. Mary's College, Kansas	Okla.	Rempe, James Henry A.B. 1956, The George Washington University	Md.
Pyles, LeRoy Andrew B.S. in Com. 1951, University of Virginia	Md.	Renner, Arnold Edward B.S. in E.E. 1954, Purdue University	Va.
		Renner, Joseph Niel B.S. 1935, University of Oregon	D.C.
		Reuben, S. Jesse A.B. 1958, The George Washington University	Va.
Quill, John Joseph A.B. 1950, LL.B. 1953, The George Washington University	Va.	Reyback, James Mackie B.S. 1943, U. S. Naval Academy	Md.
Quinn, Thomas Alford B.S. 1959, Brigham Young University	Conn.	Reynolds, William Carter B.S. in M.E. 1957, Swarthmore College	Pa.
Quist, Gordon Jay A.B. 1959, Michigan State University	Mich.	Rheninbeck, Dale Russell A.B. 1956, University of Wisconsin	Wis.
of Agriculture and Applied Science		Richards, Gerald Francis, Jr. B.B.A. 1956, Niagara University	N.Y.
Quist, Raymond Hugo B.S. 1957, Newark College of Engineering	Va.	Richards, Suzanne Virginia A.B. 1948, J.D. 1957, The George Washington University	D.C.
		Richardson, Gordon Albert B.S. 1958, The George Washington University	D.C.
Rabinowitz, Jerry A.B. 1958, West Virginia Wesleyan College	N.Y.	Richie, David Arthur A.B. 1958, Haverford College	Va.
Rajkatzadeh, Djavad B.S. in C.E. 1957, University of New Mexico	Iran	Riddle, James A.B. 1957, The George Washington University	Pa.
Rambo, Sylvia Hilda A.B. 1958, Dickinson College	N.M.	Riggins, Wayland Henry B.S. 1956, Clemson Agricultural College	Va.
Ramik, Vincent Lawrence B.S. 1957, Pennsylvania State University	Pa.	Ritz, Marie Magdalen A.B. 1957, The George Washington University	Pa.
Ramos, Liberto A.B. 1953, University of Puerto Rico	Puerto Rico	Roark, Mary Trufant A.B. 1945, Tulane University	Va.
Randa, John Charles B.S. in E.E. 1957, Marquette University	Wis.	Roberts, Charles Franklin A.B. 1957, State College of Washington	Wash.
Rapo, Rudyard Kent B.S. 1957, Washington University	Va.	Robertson, James Colvert B.S. 1957, University of Maryland	D.C.
Rawling, George Thomas B.B.A. 1958, Upsala College	N.J.	Robinson, Charles Augustus, Jr. B.E.E. 1950, University of Virginia	Va.
Ravice, Leonard B.S. 1953, University of Connecticut	Va.	Robinson, Jack Wright B.S. 1955, University of Tennessee	Tenn.
Ray, Warren Estes B.S. 1952, M.S. 1956, Oklahoma State University	D.C.	Robinson, Robert Henry B.S. 1956, Lehigh University	Pa.
Raymond, Richard Lee A.B. 1951, Swarthmore College	Pa.	Rockman, Howard B.S. in M.E. 1959, Drexel Institute of Technology	Md.
Reagin, Ronald William B.S. 1958, University of Missouri	Va.	Rodgers, John Edward LL.B. 1949, Vanderbilt University	Va.
Reiden, Jack A.B. LL.B. 1954, Southern Methodist University	D.C.	Rodgers, John Ferguson A.B. 1956, University of Louisville	Ky.
Reddie, William McKeenan, Jr. A.B. 1952, Colgate University	Va.	Rogers, Bobby Wayne B.S. in C.E. 1959, North Carolina State Teachers College	N.C.
Reep, John Ottem B.S. in I.E. 1957, University of North Dakota	N.D.	Rohall, Donald Earl A.B. 1956, University of Pittsburgh	Pa.
Romer, Ralph Raymond, Jr. A.B. 1955, University of Washington	Md.	Roher, Joseph B.M.E. 1957, Rensselaer Polytechnic Institute	N.Y.
Rever, Alvin Clyde A.B. 1952, University of Maryland	Md.	Rollinson, Mark A.B. 1958, Duke University	D.C.

Romano, James Joseph, Jr.
M.E. 1956, Stevens Institute of Technology
Ropa, Donald Willard
A.B. 1949, Kenyon College
Rose, Jenny Krohn
A.B. 1958, Hood College
Rose, Shep Kalman
B.S. 1955, University of Georgia
Roselle, Joseph Crescent
A.B. 1959, Florida Southern College
Rosen, Gerald Stuart
B.S. 1950, Michigan State University of Agriculture and Applied Science
Rosenstein, Irwin Bennett
B.S. 1958, University of Pennsylvania
Rosenstein, Joel Bruce
B.S. 1957, University of Maryland
Ross, Leo
B.M.E. 1928, Northeastern University
L.L.B. 1932, The George Washington University
Ross, Murray H.
B.B.A. 1933, College of the City of New York
Rossi, Anthony Gerald
B.S.S. 1957, John Carroll University
Rotert, Warren Herbert
B.S. in I.E. 1952, Lafayette College
Rothrock, Thomas Jefferson
B.S. 1955, University of Maryland
Rowland, Bertram Irwin
B.S. 1950, University of California at Los Angeles
Ph.D. 1954, University of Washington
Roy, Raymond Lionel
A.B. 1953, Colby College
Roybal, Ben Frank
A.B. 1956, New Mexico Highlands University
Rubin, Lonnie Bruce
B.S. 1954, University of Maryland
Rubin, Rose A.
Rudman, Paul Lewis
A.B. 1957, Yale University
Ruppert, Thomas Otto, Jr.
A.B. in Govt. 1957, The George Washington University
Rusis, Robert Heinrich
A.B. 1956, The George Washington University
Russell, Carlton Eugene
B.S. 1952, U. S. Coast Guard Academy
Rykhus, Douglas Joseph
A.B. in Govt. 1951, The George Washington University
Rytlewski, Francis Leon
B.S. in Geol. Eng. 1953, Montana School of Mines and Metallurgy

S

Sabatine, Paul Leopold
B.S. 1950, Georgetown University
Sachs, Daniel
B.S. 1955, Cornell University
Sacks, Stanley
B.S. 1954, Queens College
Saille, George Oscar
B.Ch.E. 1953, University of Cincinnati
Sakayan, Harold Aram
B.S. 1957, University of Maryland

Va. Salem, Irving
A.B. in Govt. 1957, The George Washington University
Ind. Salins, Donald Jack
B.S. 1954, D.C. Teachers College
N.J. Sandell, Charles Wilhelm
A.B. 1958, University of Washington
La. Sanders, Roger Edward
A.B. 1951, Indiana University
D.C. A.M. 1957, Georgetown University
Sandler, Robert Norton
A.B. 1958, The George Washington University
Md. Sanner, Jay Willis
B.S. 1958, College of William and Mary
Conn. Sather, Arvid Andrew
A.B. 1954, University of Minnesota
D.C. Saxe, Jon Sheldon
B.S. in Ch.E. 1957, Carnegie Institute of Technology
D.C. Scanlan, Richard John, Jr.
B.S. in M.E. 1952, Michigan College of Mining and Technology
Md. Schachner, Julian
B.S. in M.E. 1952, University of Arizona
Ohio Schellenger, Marshall Leeds
Va. A.B. in Ed. 1957, The George Washington University
Va. Schlesinger, Patrick Jerome
B.S. in E.E. 1957, University of Oklahoma
Va. Schmid, Otto, Jr.
B.E.E. 1953, Georgia Institute of Technology
Maine Schmidt, Chadwick
A.B. 1951, Washington Missionary College
N.M. Schmidt, Herman Edward
A.B. 1956, Washington College
Md. Schmidt, Manfred J.
A.B. 1951, Roosevelt University
Pa. Schmidt, Richard Huestis
A.B. 1954, Middlebury College
Maine Schmidt, Wilfred Otto
B.S. in E.E. 1949, Wayne University
Va. L.L.B. 1955, Georgetown University
Md. Schmude, Richard Willis
A.B. 1953, University of Michigan
Calif. Schneberg, Harold Sidney
A.B. in Govt. 1957, The George Washington University
Md. Schnell, William Nelson
A.B. 1958, University of Illinois
D.C. Schreiber, Eugene Joseph
B.S. in C.E. 1959, Purdue University
Schron, Dean
B.E.E. 1956, Rensselaer Polytechnic Institute
Schuetz, William Adolph
B.S. in M.E. 1959, Drexel Institute of Technology
Md. Schultz, James Clement
B.S. 1956, University of Nebraska
N.Y. Schumann, Alfred William
B.S. 1949, Lewis and Clarke College
Md. Schurman, Charles Edwin
B.S. 1947, U. S. Merchant Marine Academy
Ohio B.S. 1951, University of California
D.C.

Schwadron, Martin Paul B.S. 1956, College of the City of New York	N.Y.	Sherling, Fred Willie B.S. 1957, University of Tennessee	D.C.
Schwartz, Arthur B.S. in I.E. 1958, Iowa State College of Agriculture and Mechanic Arts	Va.	Sherman, Edward Lawrence A.B. 1951, A.M. 1953, Roosevelt University	Md.
Schwartz, Charles H. B.S. in E.E. 1957, Drexel Institute of Technology	Pa.	Sherman, Neil B.S. 1958, American University	D.C.
Schwartz, Howard Shelton B.B.A. 1959, University of Miami	Va.	Shields, Daniel Wooley A.B. 1949, Princeton University	Md.
Schwartz, Carl Walter B.C.E. 1958, Cornell University	Wis.	Shomette, Louis Edwin, Jr. B.S. 1953, Georgetown University	Va.
Schweitzer, Thomas Charles B.S. 1955, Michigan College of Mining and Technology	Mich.	Shott, Frank B., Jr. B.S. in F.S. 1959, Georgetown University	Mont.
Sciatica, Richard Salvatore B.S. in E.E. 1954, Lafayette College	Md.	Shrinsky, Jason Lee A.B. 1959, University of Pittsburgh	Pa.
Scott, Kenneth John A.B. 1951, Harvard University	D.C.	Sides, William John, Jr. A.B. 1957, DePauw University	N.Y.
Scott, William Alexander III A.B. 1958, Johns Hopkins University	D.C.	Siegel, Allen George B.S. 1954, The George Washington University	N.C.
Sears, Mary Helen A.B. 1950, Cornell University	Va.	Siegel, Julian Lee B.S. 1954, The George Washington University	Md.
Sears, Robert John, Jr. B.S. in E.E. 1954, Carnegie Institute of Technology	N.Y.	Siegmund, Ralf Hermann Arturo Diploma Geophysiker 1950, University of Berlin, Germany	Va.
Sehade, Donald Henry A.B. 1957, The George Washington University	Va.	Silber, Richard Joel A.B. 1959, Dickinson College	Pa.
Sehastian, Leland Ancel B.S. 1952, Arkansas State Teachers College	Ark.	Simmons, William James, Jr. B.S. in E.E. 1957, University of Pittsburgh	Va.
Seimur, Frank Allyn B.S. in E.E. 1957, University of Connecticut	Md.	Sincoff, Richard Joseph A.B. 1956, The George Washington University	Md.
Segelke, Vern William B.S. in C.E. 1955, University of Colorado	Colo.	Singer, Donald James B.S. in Ch.E. 1956, Michigan State University of Agriculture and Applied Science	Md.
Seideman, Richard Reynolds A.B. 1955, Pennsylvania State University	N.J.	Sinrod, Donald Edward A.B. in Govt. 1959, The George Washington University	D.C.
Seller, Donald Waters, Jr. A.B. 1956, College of William and Mary	Va.	Sippel, Kenneth Fred A.B. 1950, University of California	Va.
Selman, Leonard Sandor B.S. 1953, University of Connecticut	N.Y.	Sixbey, Daniel Warren A.B. 1954, University of Maryland	Md.
Sennosian, Edward, Jr. A.B. in Govt. 1955, The George Washington University	Va.	Sizer, Henry Sears A.B. 1955, LL.B. 1958, Yale University	N.Y.
Sesio, Paul Peter B.S. 1954, Carnegie Institute of Technology	Pa.	Skinner, Ernest B. LL.B. 1952, Washburn University of Topeka	Kans.
Senter, Jacob A.B. 1958, University of Alabama	Ala.	Skinner, John Vernon, Jr. B.S. 1955, Auburn College	Ga.
Seymour, Alfons Paul LL.M. 1927, University of Poznan, Poland	Md.	Skoler, George Atley A.B. 1952, American International College	N.Y.
Shaw, Clinton Robert B.S. in E.E. 1957, Drexel Institute of Technology	Pa.	Skovran, Nicholas B.S. 1950, M.S. 1952, Pennsylvania State University	Va.
Shaw, Melvin B.S. in E.E. 1957, Drexel Institute of Technology	Pa.	Slabach, Stephen Hall B.S. 1957, Northwestern University	Okla.
Shaw, Robert B.S. 1959, University of Massachusetts	Va.	Slover, Julius Elwood B.S. in Ed. 1942, Southeast Missouri State College	Mo.
Shaw, Ivan Jay B.S. 1954, University of Maryland	D.C.	Smegal, Thomas Frank, Jr. B.S. in Ch.E. 1957, Michigan College of Mining and Technology	Minn.
Shaw, John Tyler M.S. 1950, U.S. Naval Academy	Wash.	Smelz, Jervis Leo B.S. 1950, Georgetown University	Ill.
Shaw, Kenneth John B.S.C. 1955, State University of Iowa	Iowa	Smethurst, Raymond Stevens, Jr. B.Met.E. 1958, Cornell University	D.C.

Smietan, Irwin Lawrence B.S. in M.E. 1955, University of Miami	Fla.	Spradlin, Thomas Richard A.B. 1959, The George Washington University	Olds
Smith, Christopher Allan A.B. 1955, Harvard University	Conn.	Spruill, Jerry Lynn B.S. in Ch.E. 1952, Grove City College	D.C.
Smith, Donald Le Roy B.S. 1954, Iowa State College of Agriculture and Mechanic Arts	Iowa	Stafford, John Rogers A.B. 1959, Dickinson College	Va.
Smith, James Clarence A.B. 1958, University of Florida	Fla.	Stafford, Paul Gordon A.B. 1956, University of Maryland	Md.
Smith, James Enlo B.S. 1952, South Dakota School of Mines and Technology	S.D.	Stahl, Robert Frederick B.S. 1954, Washington College	D.C.
Smith, Jerome David B.S. 1958, University of Alabama	Ala.	Stanhagen, William Harold B.S. in C.E. 1952, University of Southern California	Va.
Smith, John Gordon B.S. 1955, Columbia University	N.Y.	Stanley, Frank Leslie B.S. 1958, University of Illinois	Kr.
Smith, John Henry B.S. 1953, U. S. Naval Academy	Va.	Stanton, James Andrew A.B. 1959, Washash College	Ind.
Smith, Jordan Marshall A.B. 1957, Washington and Lee University	Md.	Starboard, James William A.B. 1959, University of Maryland	Md.
Smith, Mary Louise B.S. 1926, University of Chicago	Ga.	Stathopoulos, George Nicholas A.B. 1957, University of Michigan	Mich.
A.M. in Ed. 1952, The George Washington University		Statland, Edward Morris A.B. in Govt. 1954, The George Washington University	D.C.
Smith, Richard Ireland A.B. 1955, University of Maryland	Md.	Staton, Robert Vincent A.B. 1958, University of North Carolina	N.C.
Smith, Robert Warren B.E.E. 1955, Rensselaer Polytechnic Institute	Md.	Staudt, James Everette B.S. in M.E. 1957, North Dakota Agricultural College	Va.
Smith, Warrington Gilmore B.S. 1949, M.B.A. 1950, University of Maryland	Md.	Stauffer, Robert Fred A.B. 1951, University of Wyoming	D.C.
Smith, William Andrew III B.M.E. 1950, Catholic University of America	Md.	Stavros, George Pete A.B. 1958, Centre College	Kr.
Smith, William Weston B.S. 1950, University of Wisconsin	Va.	Stefursky, Walter Andrew A.B. 1959, University of Scranton	Pa.
Snead, James Elbert B.S. 1959, University of New Mexico	N.M.	Stein, Charles Alan B.S. 1954, Duke University	Md.
Sniado, John Luis B.S. in Ch.E. 1953, University of Massachusetts	Va.	B.Ch.E. 1956, University of Florida	Ohio
Snider, Edwin Wallace A.B. 1947, Princeton University		Stein, Donald Phillip B.S. 1958, Case Institute of Technology	Md.
Snyder, Dennis Truman A.B. 1957, University of Maryland	Va.	Stein, Murray Robert B.S. 1953, D.C. Teachers College	Va.
Snyder, Edward Jarrin A.B. 1955, Catholic University of America	Va.	Stephenson, Garth A. A.B. 1951, Brigham Young University	Pa.
Snyder, George Roderick A.B. 1954, Pennsylvania State University	Md.	Stern, Helman I. B.S. in E.E. 1957, Drexel Institute of Technology	D.C.
Snyder, Marvin B.E.E. 1954, Cornell University	D.C.	Stern, Marvin Robert B.S. in Ch.E. 1955, Drexel Institute of Technology	D.C.
Snyder, Royce Wade, Jr. A.B. 1954, Dickinson College	Pa.	Stern, Sheldon B.S. 1958, New York University	Pa.
Solter, Myron Woodrum A.B. in Govt. 1950, The George Washington University	N.Y.	Sternfels, Lewis Bernard A.B. 1955, B.S. 1956, Columbia University	Md.
Spaeth, Earl Chester A.B. 1942, Oberlin College	Pa.	Stewart, John Francis B.S. 1955, Georgetown University	Idaho
Ph.D. 1946, University of California at Los Angeles		Stiburek, Beverly Joan B.S. 1955, Brigham Young University	Va.
Spence, Harrison Michael A.B. 1957, University of Idaho	D.C.	Stirewalt, Edward Neale A.B. 1938, High Point College	Md.
Sperling, Joseph Bear A.B. 1957, College of the City of New York	Va.	A.M. 1942, University of North Carolina	D.C.
Spiher, Alan Thurman, Jr. A.B. 1939, University of California at Los Angeles	Idaho	Stock, Eugene Allen A.B. 1955, University of Washington	D.C.
	N.Y.	Stoffel, Wolmar John Ch.E. 1957, University of Wisconsin	D.C.
		Stoiciu, Virgiliu Masters 1933, Juridical Doctor 1935, University of Bucharest	N.Y.
	Va.	Stone, Robert L. B.S. 1958, Queens College	

Stone, Robert Ray A.B. 1958, William Jewell College	Va.	Terry, David Thomas B.S. in Ch.E. 1956, Purdue University	Va.
Stone, Samuel Beckner B.S. in E.E. 1955, Virginia Polytechnic Institute	Va.	Terzian, Louise Anderson B.S. 1934, University of Pennsylvania	Md.
Stone, Steven Faraday B.Ch.E. 1957, Rensselaer Polytechnic Institute	N.Y.	Teschner, David B.S. in E.E. 1955, Newark College of Engineering	Va.
Stopak, Bernard B.S. 1959, University of Maryland	D.C.	Thaler, Martin S. B.B.A. 1953, College of the City of New York	D.C.
Strand, Henry Joseph A.B. 1954, A.M. 1958, University of Chicago	D.C.	LL.B. 1958, Yale University	
Strobel, Raymond Stephen B.S. in M.E. 1956, Washington University	Mo.	Thomas, Carl Otis B.S. 1957, Texas College of Arts and Industries	D.C.
Strompf, Jan Arthur B.S. 1958, University of Maryland	Md.	Thomas, Dudley Breckinridge A.B. 1955, Washington and Lee University	D.C.
Sturm, Rex Logan B.S. 1959, State University of Iowa	Nebr.	Thomas, Harrison Wendell B.S. 1954, Maryland State Teachers College, Bowie	D.C.
Sudaik, Louis Frederick B.S. 1941, U. S. Coast Guard Academy	Mass.	Thomas, John George B.B.A. 1954, University of Miami	Md.
LL.B. 1948, The George Washington University		Thompson, John Charles B.S. 1957, University of Rochester	Va.
Sullivan, Robert Cook B.S. 1955, Brown University	R.I.	Thompson, Robert B.S. 1958, University of Illinois	Ill.
Sullivan, Robert Emmet A.B. 1949, University of Maine	D.C.	Thornton, Leonard Henry A.B. 1957, University of Vermont	N.Y.
Sullivan, Vincent Edward B.Ch.E. 1958, Villanova University	Calif.	Thornton, William Clarence A.B. 1958, University of Nevada	Nev.
Sundheim, Robert Brandt B.S. in E.E. 1958, Worcester Polytechnic Institute	Mass.	Tindal, Donald Roger B.S. 1954, University of Maryland	D.C.
Sutherland, Malcolm Livingston B.S. 1957, Carnegie Institute of Technology	Miss.	Tischler, Charles Merle A.B. 1952, M.S. 1954, Columbia University	Pa.
Sutherland, Richard Clifton II B.S. 1955, Virginia Military Institute	Va.	Tolford, John Charles A.B. 1954, University of Michigan	Mich.
Sutter, Marshall Wayne B.S. 1954, University of Illinois	Pa.	Toothman, Byron Rimbey A.B. 1946, Fairmont State College	W.Va.
Swankin, David Arnold M.S. 1954, Brandeis University	Md.	A.M. 1948, West Virginia University	
Swartz, William John B.S. in M.E. 1956, Duke University	Kans.	Torchin, Norman Gilbert B.S. 1951, The George Washington University	D.C.
Sweeder, Michael Jon B.E. 1957, Yale University	N.J.	Tower, Robert Gray B.S. 1941, U. S. Naval Academy	Ill.
Sweeney, John Lenney A.B. 1951, A.M. 1954, Michigan State University of Agriculture and Applied Science	N.J.	Tran, Tin Vu Diploma of Licence in Law 1953, Academy of Paris, France	D.C.
Swift, George Lee A.B. 1957, Johns Hopkins University	Mich.	Tranchitella, Nicola B.S. 1954, Indiana University	Md.
Swope, William Edwin A.B. 1958, University of New Mexico	Texas	Treese, James Rintoul A.B. 1956, Colgate University	Pa.
Sykes, Grant Russell B.B.A. 1950, Tulane University	N.M.	Tremain, Kenneth Dale B.S. in Ch.E. 1956, Purdue University	Ohio
A.M. in Govt. 1953, The George Washington University	D.C.	Tribble, John Henry B.S. in C.E. 1956, The Citadel	S.C.
Sylvester, Donall Hester B.S. 1952, Murray State College	Md.	Trimas, Marvin B.S. in I.E. 1956, Pennsylvania State University	Va.
T			
Tamte, Roger Roy B.S. in I.E. 1957, State University of Iowa		Tripp, Turner Clarence B.S. in B.A. 1942, New York University	Md.
Taillon, Thomas Louis B.S. in I.E. 1957, University of Pittsburgh	Minn.	Trocino, Frank Phillip A.B. 1956, University of Maryland	N.J.
Terry, Ben Abner B.S. 1958, University of Buffalo	Va.	Trousdale, Gordon James B.S. in F.S. 1956, Georgetown University	N.D.
	W.Va.	Trousof, Natalie A.B. 1947, A.M. 1950, Columbia University	D.C.
		Troy, Sylvia Carol A.B. 1956, University of Michigan	Va.

Truluck, Dalton Loftis B.S. 1956, Clemson Agricultural College	S.C.	Vican, George Juris Doctor 1949, Charles University of Prague, Czechoslovakia	D.C.
Trust, Frederick Ephriam A.B. 1958, Pennsylvania State University	D.C.	Viccellio, Nancy Blair A.B. 1934, Meredith College A.M. 1939, University of Virginia	Va.
Tupman, Wilbur Crandell B.I.E. 1949, Georgia Institute of Technology	Va.	Vickers, Robert Vernon B.M.E. 1957, General Motors Institute	N.Y.
Turnage, Kirby Loftin, Jr. A.B. 1957, University of Alabama	Miss.	Villarejo, James Victor A.B. 1939, University of Wisconsin	Neb.
Turner, Mary Johnston A.B. 1951, The George Washington University	D.C.	Visek, Franklin Joseph B.S. 1957, Municipal University of Omaha	N.Y.
Turney, Jack Rush A.B. 1956, Western Maryland College	Md.	Vogel, Clifford Warren A.B. 1953, Cornell University	Min.
Turpen, Donald Cleveland B.S. 1959, University of New Mexico	N.M.	Vogel, Joseph Peter B.S. in E.E. 1958, South Dakota State College of Agriculture and Mechanic Arts	D.C.
Twohey, Thomas Michael B.S. 1959, University of Maryland	Md.	Volterra, Max B.S. 1957, Brown University	
U		W	
Uilkema, John Klaas B.S. in M.E. 1957, University of Michigan	Va.	Walker, John Henry A.B. 1957, University of South Dakota	Md.
V		Walker, Mary McBride A.B. 1955, Smith College	Va.
Vail, Thomas L. C. A.B. 1956, The George Washington University	Va.	Walker, Richard Malcolm A.B. 1956, The George Washington University	Va.
Valdivieso, Jorge Lucas P. B.S. in B.A. 1955, Georgetown University	Puerto Rico	Wall, Clement James B.S. 1928, Northwestern University LL.B. 1931, Chicago-Kent College of Law	Calif.
Valentine, Andrew Jackson B.S. 1945, U. S. Naval Academy J.D. 1954, The George Washington University	Fla.	Wall, Tamara J. A.B. 1955, Lewis and Clarke College	Md.
Vance, Anthony Charles B.S. 1954, Pennsylvania State University	Pa.	Waller, John Robert B.S. 1953, Georgetown University	D.C.
Vandenburg, John Perley B.S. in E.E. 1956, University of Michigan	Mich.	Walls, Donald Francis A.B. 1954, M.B.A. 1959, Cornell University	Md.
Vande Sande, George B.S. in E.E. 1948, University of Michigan	Md.	Walton, Lawrence Mason B.S. 1950, Virginia Polytechnic Institute	Va.
Van Kirk, Roger Alan B.S. in E.E. 1957, University of Vermont	N.J.	Ward, David Hugh B.S. in Mgt. Eng. 1957, Rensselaer Polytechnic Institute	D.C.
Van Metre, John Lee, Jr. A.B. 1959, Duke University	W.Va.	Ward, Julia A.B. 1923, Ph.D. 1940, Bryn Mawr College	D.C.
Vartzikos, Nicholas A.B. in Govt. 1959, The George Washington University	Wis.	Wardell, Richard Norman B.S. in Met. E. 1952, Illinois Institute of Technology	Kans.
Vatske, Albert Ivan A.B. 1959, University of Connecticut	N.H.	Warden, Ernest Albert A.B. 1955, University of Wichita	Fla.
Velarde, Manuel Aspillaga Law Degree 1957, Universidad Nacional Mayor de San Marcos, Peru	D.C.	Warden, William Franklin, Jr. A.B. 1954, Stetson University	Va.
Velde, Richard Whittington B.S. 1953, A.M. 1954, Bradley University	Ill.	Warlick, George William B.S. in E.E. 1956, Duke University	Va.
Verkler, Jerry Thomas A.B. 1954, University of New Mexico	N.M.	Waterval, Richard Adolf A.B. 1952, University of Maryland	Mich.
Verkouteren, Theodore Robert B.S. 1951, University of Maryland LL.B. 1957, The George Washington University	D.C.	Watkinson, William Willison A.B. 1959, Western Michigan College	W.Va.
Vernon, Robert Gerard A.B. 1956, University of Utah	N.Y.	Watson, William Edward A.B. 1958, West Virginia Wesleyan College	Ohio
Vetter, Charles Thomas, Jr. A.B. 1946, Hamilton College LL.B. 1953, National University	D.C.	Watterson, James Godfrey B.S. in E.A. 1954, Case Institute of Technology	Tenn.
		Weakley, Harold Wade B.S. 1954, Tennessee Polytechnic Institute	

Weaver, James Richard B.S. 1957, Elizabethtown College	Pa.	Wiener, Richard A.B. 1950, Columbia University	D.C.
Webb, Haven Noel B.S. 1954, U. S. Naval Academy	Tenn.	Wilbur, Helen Jeanette A.B. 1956, Bates College	Va.
Webb, Thomas Harry B.S. in C.E. 1944, Ohio Northern University	Md.	Wilde, Peter Van Dyke B.S. in Ch.E. 1956, Lehigh University	Va.
Weeks, Cora Emma A.B. 1957, Miami University	D.C.	Wildhack, William August, Jr. B.S. 1957, Miami University	Va.
Wegener, Henning Refendar 1958, University of Bonn, Germany	Md.	Wilfond, Arthur E. B.S. 1956, Drexel Institute of Technology	Pa.
Wellacher, Robert George B.S. 1957, Columbia University	D.C.	Willette, Helen Barbara A.B. 1941, Syracuse University	D.C.
Weinstein, Les J. B.S. in M.E. 1956, University of Pennsylvania	Md.	Williams, Gerald Edward B.S. 1955, Delta State College	Ark.
Weinstein, Louis B.S. in E.E. 1955, University of Pennsylvania	Pa.	Williams, Jack Haven A.B. 1956, Pennsylvania State University	Pa.
Welch, John Edward B.S. 1951, University of Maine	Maine	Williams, James William B.S. in E.E. 1957, Vanderbilt University	Va.
Welch, Paul Hesse A.B. in Govt. 1957, The George Washington University	Va.	Williams, Jerry Don B.B.A. 1959, Oklahoma State University	Okla.
Weld, John Philip B.S. 1957, East Carolina College	N.C.	Williams, Melvin Pearson B.E.E. 1957, Rensselaer Polytechnic Institute	Va.
Wendt, William Robert B.S. in Met.E. and A.E. 1935, University of Wisconsin	Va.	Williams, Spencer Benjamin, Jr. A.B. 1947, College of William and Mary	Md.
Werth, Michael Wolf B.S. in E.E. 1948, Illinois Institute of Technology	D.C.	Williamson, Gwenda Pryse A.B. 1948, Vassar College	Va.
Weyler, Albert Sheldon B.S. in Ch.E. 1956, University of Wisconsin	Va.	Williamson, Harold Anthony B.S. in M.E. 1957, University of Wisconsin	Va.
Wheeler, Larry Myron B.B.A. 1954, University of Georgia	Va.	Willinger, Warren Jay A.B. in Govt. 1959, The George Washington University	N.Y.
Wilcock, Carl Simpson B.S. in S.W. 1949, A.M. 1950, University of Arkansas	D.C.	Willis, William A., Jr. B.S. 1958, University of North Carolina	N.C.
Wilder, John William B.S. 1957, Iowa State College of Agriculture and Mechanic Arts	Ark.	Willoner, Ronald Andrew A.B. 1955, University of Maryland	Md.
Wilson, Leonard Alfred, Jr. B.M.E. 1957, University of North Carolina	Iowa	Willson, Leonard Alfred, Jr. B.M.E. 1957, University of North Carolina	N.C.
White, Alton Pharoah, Jr. B.S. in C.E. 1948, University of Arizona	D.C.	Wilson, Edwin Paul A.B. 1951, University of Portland, Oregon	Va.
White, Harry DeNeal, Jr. B.S. 1955, University of Maryland	Ariz.	Wing, John Adams A.B. 1958, Union College and University	N.Y.
White, James Houston A.B. 1935, Washington and Lee University	D.C.	Wise, Robert Wayne B.S. 1956, McPherson College	Va.
White, James Patrick A.B. 1953, J.D. 1956, State University of Iowa	Va.	Wisecarver, Betty Marie A.B. 1957, University of Virginia	D.C.
White, Wayne Day A.B. 1951, Brigham Young University	Iowa	Wiser, Clifford Lawrence B.S. 1952, University of Maryland	Md.
Whitford, Richard Charles A.B. 1957, Washington and Lee University	Va.	Witt, William Henry A.B. 1941, Harvard University	D.C.
Whithead, Joseph Mothey A.B. 1957, University of Richmond	Md.	Wohl, Paul A.B. in Govt. 1954, The George Washington University	N.Y.
Whitlock, Douglas II A.B. 1955, Duke University	Va.	Wolfe, Alan David B.S. 1952, Queens College	D.C.
Whitman, Bruce Nairn B.S. 1951, Trinity College	Va.	M.S. 1956, Massachusetts Institute of Technology	
Wicker, Raymond Kiefer LL.B. 1951, Newberry College	Texas	Wolson, Milton Marvin B.S. in A.E. 1959, University of Alabama	N.Y.
Wicks, Raymond Kiefer LL.B. 1951, Newberry College	S.C.		

		Z		
Wong, James Aubrey	D.C.			Mich.
B.M.E. 1951, The George Washington University				
Woodruff, Eugene Bruce	D.C.	Zaratzian, Virginia Louise		
B.S. 1954, University of Michigan		B.S. 1942, B.S. in Phar. 1946, M.S. 1949, University of Michigan		Pa.
M.S. 1957, Purdue University		Ph.D. 1956, Wayne State University		
Woodward, Charles Carroll Maccubbin	Md.	Zarnosky, Peter		N.Y.
B.S. in C.E. 1951, Virginia Military Institute		B.S. 1954, University of Scranton		
Worthington, Raymond Leroy	Md.	Zavodnik, Marvin Edward		D.C.
B.S. 1941, University of Maryland		B.S. 1952, Syracuse University		D.C.
Wray, James Creighton	N.Y.	Zeiger, Leon B.		
B.M.E. 1958, Villanova University		Zekas, Raymond		Me.
Wyman, Charles Malcom	Mass.	A.B. 1958, Temple University		
A.B. 1955, The George Washington University		Zettler, Arthur Michael		D.C.
Y		A.B. 1959, University of Maryland		
		Ziebarth, Thomas A.		
Yahn, Robert A.	W.Va.	Ph.B. 1950, Marquette University		Va.
B.B.A. 1956, University of Miami		LL.B. 1955, LL.M. 1957, Georgetown University		
Yancey, Quillian S.	Fla.	Zieg, Robert Lloyd		Me.
B.S. 1949, Florida Southern College		B.I.E. 1956, General Motors Institute		
Yeager, Arthur George	Fla.	Ziehm, Eugene Carl		N.Y.
B.E.E. 1956, University of Florida		A.B. 1959, University of Buffalo		
Yeatman, William Paul	D.C.	Zimmer, Andrew Peter		N.Y.
B.S. in Ed. 1954, D.C. Teachers College		A.B. 1951, Harvard University		
Yodice, John Salvatore	N.Y.	Zirpoli, Lewis		Me.
A.B. 1954, Brooklyn College		B.Ch.E. 1955, Polytechnic Institute of Brooklyn		
Young, Roger Donald	D.C.	Zugel, Francis Kopp		N.Y.
A.B. 1957, Randolph-Macon College		B.S. in Eng. 1957, The George Washington University		
Young, Truman Richards	Calif.	Zweben, Murray		
LL.B. 1932, The George Washington University		B.S. 1952, M.S. 1953, New York State Teachers College, Albany		
YOUNG, Maynard Lee	Va.			
A.B. 1954, Kalamazoo College				

SUMMARIES OF REGISTRATION

SPRING SEMESTER 1958-59, SUMMER TERM 1959,

FALL SEMESTER 1959-60

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

Alabama	4	New York	87
Arizona	4	North Carolina	17
Arkansas	7	North Dakota	4
California	16	Ohio	25
Colorado	6	Oklahoma	15
Connecticut	15	Oregon	2
Delaware	11	Pennsylvania	83
District of Columbia	258	Rhode Island	3
Florida	16	South Carolina	11
Georgia	5	South Dakota	5
Hawaii	6	Tennessee	5
Idaho	12	Texas	9
Illinois	27	Utah	18
Indiana	11	Vermont	3
Iowa	19	Virginia	368
Kansas	7	Washington	11
Kentucky	6	West Virginia	11
Louisiana	3	Wisconsin	13
Maine	8	Wyoming	3
Maryland	202	Guam	1
Massachusetts	23	Puerto Rico	3
Michigan	22	Canada	2
Minnesota	5	Ethiopia	1
Mississippi	5	India	1
Missouri	6	Iran	1
Montana	1	Italy	1
Nebraska	7	Korea	3
Nevada	7	Philippines	2
New Hampshire	5	Scotland	1
New Jersey	29	Turkey	1
New Mexico	10		

GRADUATES OF COLLEGES REGISTERED IN THE LAW SCHOOL

Adephia College	1	Antioch College	1
Akron, University of	2	Arizona, University of	7
Alabama Polytechnic Institute	2	Arkansas Agricultural and	
Alabama, University of	8	Mechanical College	1
Albertus Magnus College	1	Arkansas State Teachers College	2
Albright College	1	Arkansas, University of	3
Alfred University	1	Auburn College	1
Allegheny College	1	Augustana College	1
American International College	3	Bangalore Government Law	
American University	6	School, India	1
Amherst College	1	Bard College	1

Barnard College	1	Connecticut, University of	8
Bates College	2	Cooper Union	1
Beloit College	1	Cornell University	21
Berlin, University of, Germany ..	1	Dartmouth College	6
Bethany College	1	Dayton, University of	6
Bonn University, Germany	1	Delaware, University of	1
Bordeaux, University of, France ..	1	Delta State College	1
Boston College	2	Denison University	2
Boston University	2	Denver, University of	2
Bowdoin College	4	DePauw University	2
Bowling Green College of Commerce	1	Detroit, University of	5
Bowling Green State University ..	2	Dickinson College	4
Bradley University	3	District of Columbia Teachers College	19
Brandeis University	2	Drexel Institute of Technology ..	1
Brigham Young University	21	Dubuque, University of	19
Brooklyn College	6	Duke University	1
Brooklyn, Polytechnic Institute of	3	East Carolina College	1
Brown University	12	East Central State College	2
Bryn Mawr College	1	Elizabethtown College	1
Bucharest, University of	1	Emory University	1
Bucknell University	4	Earlham College	2
Buffalo, University of	3	Evansville College	2
California Institute of Technology	1	Fairmont State College	2
California State Polytechnic College	2	Florida Southern College	12
California, University of	8	Florida State University	7
California, University of, at Los Angeles	6	Florida, University of	3
Cambridge University, England ..	2	Fordham University	4
Carnegie Institute of Technology	10	Franklin and Marshall College ..	177
Case Institute of Technology	7	General Motors Institute, The ..	44
Catawba College	1	George Washington University ..	6
Catholic University of America ..	7	Georgetown University	6
Central State College	1	Georgia Institute of Technology ..	1
Centre College	2	Georgia, University of	1
Charles University of Prague, Czechoslovakia	1	Gettysburg College	2
Charleston, College of	1	Glasgow University, Scotland ..	2
Chattanooga, University of	1	Gonzaga University	1
Chicago Kent College of Law	1	Grove City College	2
Chicago, University of	3	Guilford College	1
Cho Sun University	1	Hamilton College	1
Cincinnati, University of	5	Hamline University	18
Citadel, The	4	Hanover College	1
Clark University	1	Hanover University	1
Clarkson College of Technology ..	8	Havana, University of	5
Clemson Agricultural College	2	Haverford College	2
Colby College	5	Hawaii, University of	1
Colgate University	3	High Point College	1
Colorado School of Mines	1	Hobart College	1
Colorado State College of Education	10	Hobart and William Smith Colleges	2
Colorado, University of	23	Hofstra College	2
Columbia University		Hood College	7
		Howard University	1
		Idaho State College	1
		Idaho, University of	1
		Illinois Institute of Technology ..	2

Illinois, University of	19	Miami University	3
Illinois Wesleyan University	1	Miami, University of	11
Indiana University	9	Michigan College of Mining and Technology	6
Iowa State College of Agriculture and Mechanic Arts	8	Michigan State University of Agriculture and Applied Science	7
Iowa State Teachers College	1	Michigan, University of	23
Iowa, State University of	20	Middlebury College	3
Iowa Wesleyan College	1	Minnesota State Teachers College, Moorhead	1
Istanbul, University of, Turkey ..	1	Minnesota, University of	6
Jamestown College	1	Mississippi College	1
John Carroll University	1	Mississippi State College	1
Johns Hopkins University	2	Mississippi, University of	1
Kalamazoo College	7	Missouri, University of	6
Kansas City, University of	1	Montana School of Mines and Metallurgy	2
Kansas State College of Agriculture and Applied Science	1	Montana State College	1
Kansas State Teachers College ..	2	Montana State University	1
Kansas, University of	7	Muhlenberg College	1
Kent State University	2	Murray State College	1
Kentucky, University of	2	National University	2
Kenyon College	4	Nebraska State Teachers College, Kearney	1
Lafayette College	2	Nebraska, University of	4
LaSalle College	8	Nebraska Wesleyan University ..	1
Lehigh University	1	Nevada, University of	6
Lemoyne College	9	New England College of Pharmacy ..	1
Lewis and Clark College	1	New Hampshire, University of ...	7
Lincoln University	3	New Mexico College of Agriculture and Mechanic Arts	1
Louisiana State University	1	New Mexico Highlands University ..	1
Louisville, University of	2	New Mexico, University of	8
Lowell Institute of Technology ..	1	New York, College of the City of ..	12
Loyola College	1	New York State Maritime College ..	1
Loyola University	1	New York State Teachers College, Albany	2
Low, University of, Poland	2	New York University	12
Maharaja's College, India	1	Newark College of Engineering ..	5
Maine, University of	1	Newberry College	1
Maryknoll College	2	Niagara University	2
Manuel L. Quezon University	1	North Carolina, University of	17
Marquette University	1	North Dakota Agricultural College ..	3
Marshall College	3	North Dakota, University of	1
Maryland State Teachers College, Bowie	2	North Texas State College	1
Maryland State Teachers College, Frostburg	1	Northeastern University	6
Maryland, University of	1	Northwestern University	13
Maryville College	74	Notre Dame, University of	1
Masaryk University, Czechoslovakia	2	Oberlin College	3
Massachusetts Institute of Technology	1	Ohio Northern University	1
Massachusetts Maritime Academy ..	7	Ohio State University	14
Massachusetts, University of	1	Ohio University	3
McMaster University, Canada	5	Ohio Wesleyan University	3
McPherson College	1	Oklahoma State University	5
Memphis State College	1	Oklahoma, University of	9
Meredith College	1		
Mexico City College, Mankato ...	1		

Omaha, Municipal University of ..	1	South Dakota State College of	2
Oregon State College	2	Agriculture and Mechanic Arts	5
Oregon, University of	4	South Dakota, University of	1
Pacific, College of the	1	South, University of the	4
Paris, Academy of	1	Southern California, University of	1
Paris, University of	1	Southern Illinois University	2
Pennsylvania Military College ...	1	Southern Methodist University ..	4
Pennsylvania State Teachers		Stanford University	1
College, East Stroudsburg	1	Stetson University	1
Pennsylvania State Teachers		Stevens Institute of Technology ..	5
College, Indiana	1	Swarthmore College	1
Pennsylvania State University ...	29	Sweet Briar College	6
Pennsylvania, University of	18	Syracuse University	1
Philippines, University of the ...	1	Tartu, University of, Estonia	3
Phillips University	1	Temple University	2
Pittsburgh, University of	11	Tennessee Polytechnic Institute ..	5
Portland, University of	1	Tennessee, University of	1
Poznan, University of, Poland ...	1	Texas Agricultural and Mechanical	
Pratt Institute	1	College	2
Presbyterian College	1	Texas College of Arts and	4
Princeton University	7	Industries	1
Principia College	3	Texas, University of	1
Providence College	1	Thammasat, University of,	
Puerto Rico, Polytechnic Institute		Thailand	3
of,	1	Thiel College	6
Puerto Rico, University of	1	Trinity College	2
Purdue University	16	Tufts University	1
Queens College	4	Tulane University	6
Radcliffe College	1	Union College and University	3
Randolph-Macon College	3	U. S. Coast Guard Academy	4
Rensselaer Polytechnic Institute ..	28	U. S. Merchant Marine Academy ..	16
Rice Institute	1	U. S. Military Academy	1
Richmond, University of	2	U. S. Naval Academy	1
Rochester, University of	4	Universidad Nacional Mayor de	
Roosevelt University	3	San Marco, Peru	2
Rose Polytechnic Institute	4	Upsala College	4
Rutgers University	4	Utah State University of	11
St. Louis University	1	Agriculture and Applied Science	1
St. Mary's College, Kansas	1	Utah, University of	6
St. Olaf College	1	Vassar College	6
St. Peter's College	1	Vermont, University of	3
St. Vincent College	1	Villanova University	16
San Bernardo University, Ethiopia	1	Virginia Military Institute	18
San Diego State College	1	Virginia Polytechnic Institute	1
San Francisco, University of	1	Virginia, University of	1
Scranton, University of	3	Wabash College	1
Suola Di Gurisprudinza, Ethiopia	1	Wake Forest College	1
Seoul National University, Korea ..	1	Warsaw, University of Topeka ..	7
Seton Hall University	1	Washburn University of	2
Smith College	3	Washington College	2
South Carolina State College	1	Washington and Lee University ..	6
South Carolina, University of	4	Washington Missionary College ..	1
South Dakota School of Mines and		Washington, State College of	1
Technology	3	Washington University	6

Washington, University of	9	Wilkes College	3
Wayne State University	2	William and Mary, College of	9
Wayne University	1	William Jewell College	1
Webb Institute of Naval Architecture	1	Williams College	3
Wesleyan University	1	Wisconsin State College	1
West Liberty State College	3	Wisconsin, University of	18
West Virginia University	1	Wofford College	1
West Virginia Wesleyan College ..	10	Wooster, College of	2
Western Maryland College	2	Worcester Polytechnic Institute ..	1
Western Michigan College	1	Wyoming, University of	3
Wichita, University of	3	Yale University	17
	2	Yankton College	1

SUMMARY OF LAW SCHOOL REGISTRATION

FALL SEMESTER 1959-60

	Men	Women	Total
First Year	422	15	437
Second Year	330	18	348
Third Year	225	18	243
Candidates for degree of Master of Laws.....	30	..	30
Candidates for degree of Master of Comparative Law	7	2	9
(American Practice)	3	..	3
Candidates for degree of Doctor of Juridical Science...	9	..	9
Unclassified	20	2	22
TOTAL.....	1,046	55	1,101

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Patent, Trade-Mark, and Copyright
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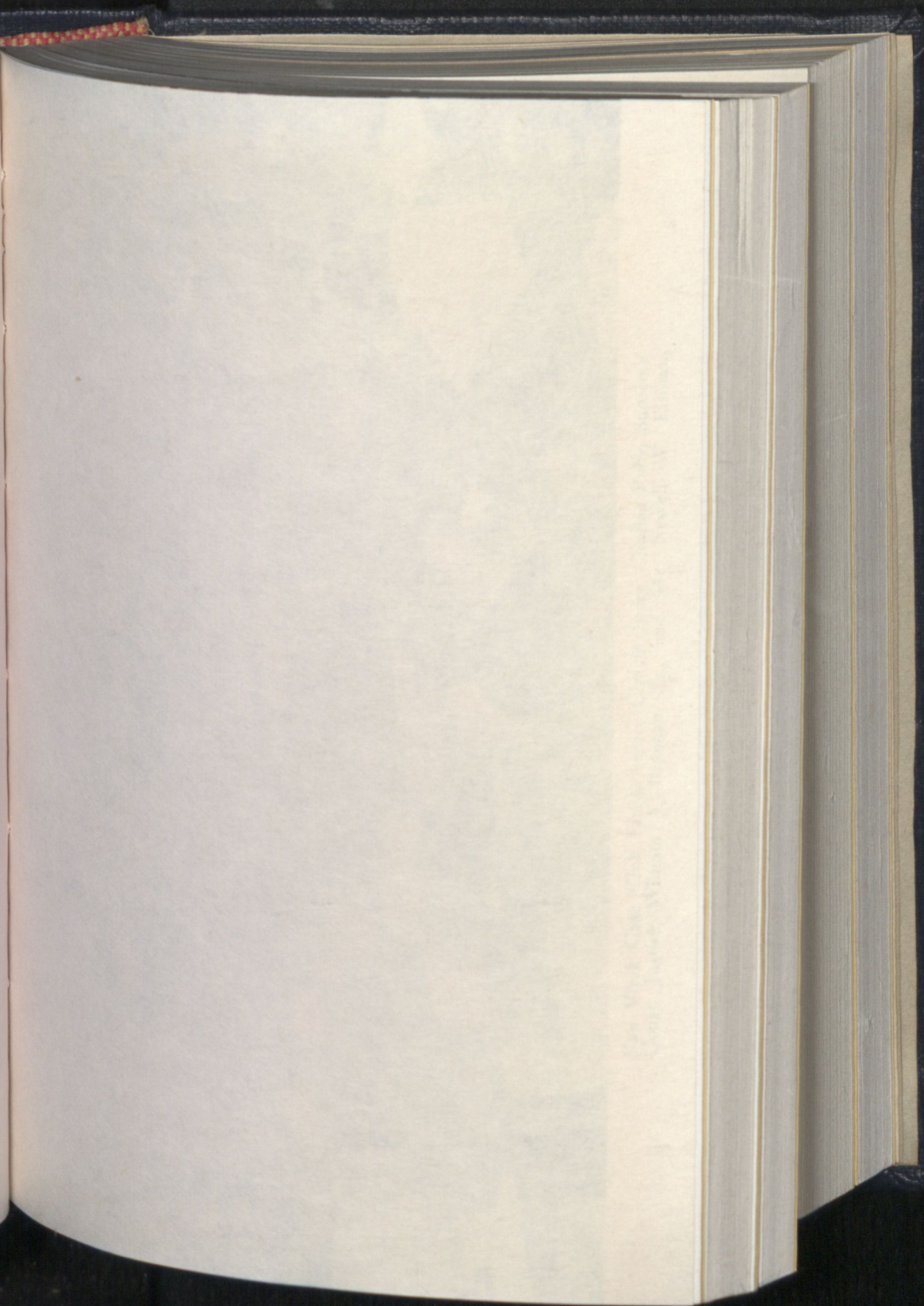
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University:
Academic status, 6
Colleges, Schools, Divisions, 6
History, 6
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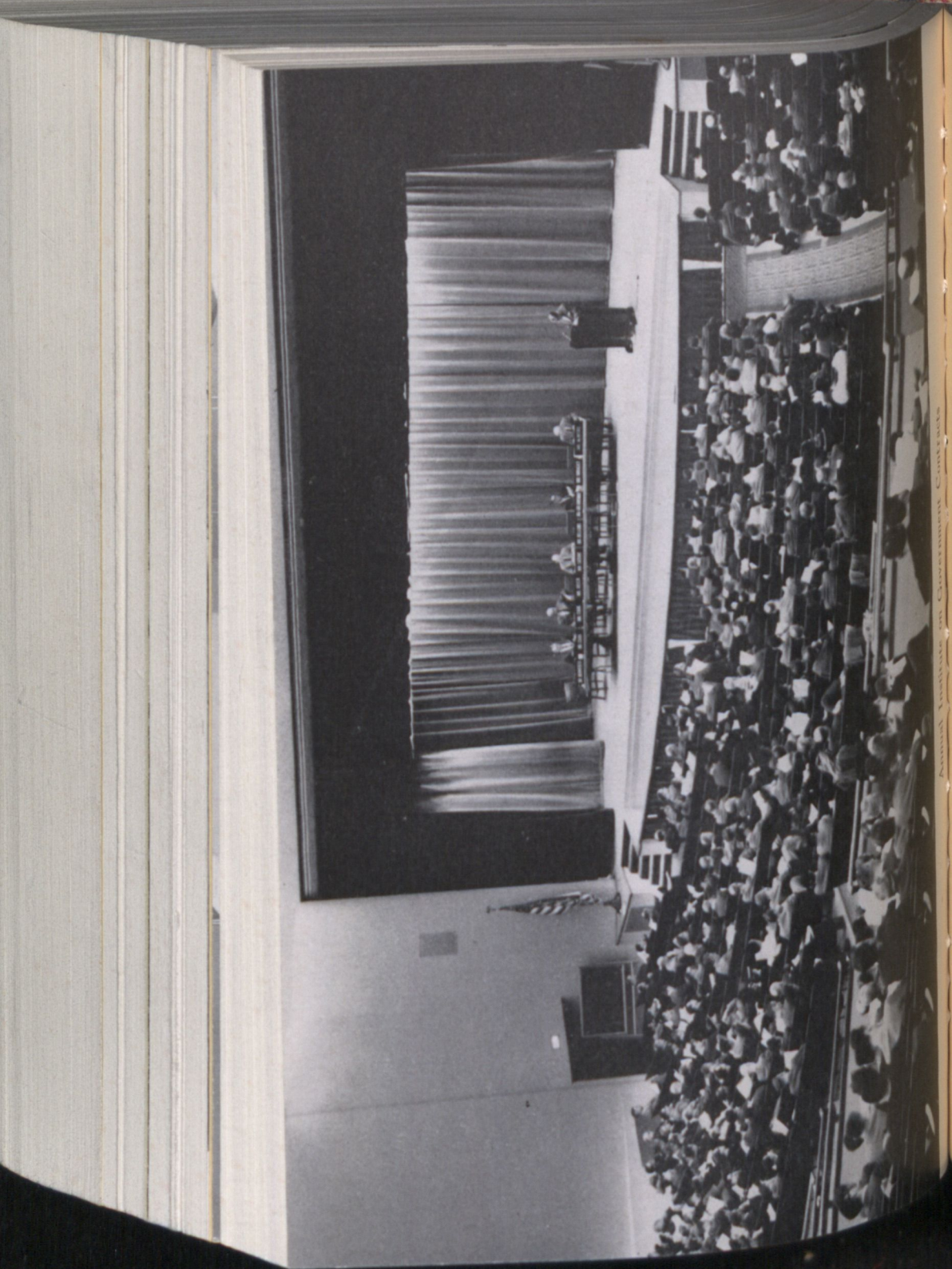
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Withdrawal and refunds, 24-25





Van Vleck Case Club Finals before Circuit Judge Charles Fahy, Supreme Court Justice William J. Brennan, Jr., and Mr. Newell W. Ellison.



THE GEORGE WASHINGTON UNIVERSITY

1821

The Junior College

1930

Columbian College (the Senior College)

1821

The Graduate Council

1893

The School of Medicine

1825

The Law School

1865

The School of Engineering

1884

The School of Pharmacy

1906

The School of Education

1907

The School of Government

1928

The College of General Studies

1950

The Division of University Students

1930

The Division of Special Students

1944

The Division of Air Science

1951

The Summer Sessions

1916

The University Hospital

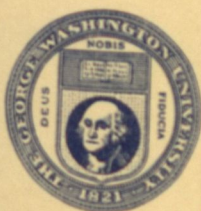
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THE
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BULLETIN

THE SCHOOL OF ENGINEERING

1960-61



WASHINGTON 6, D. C.

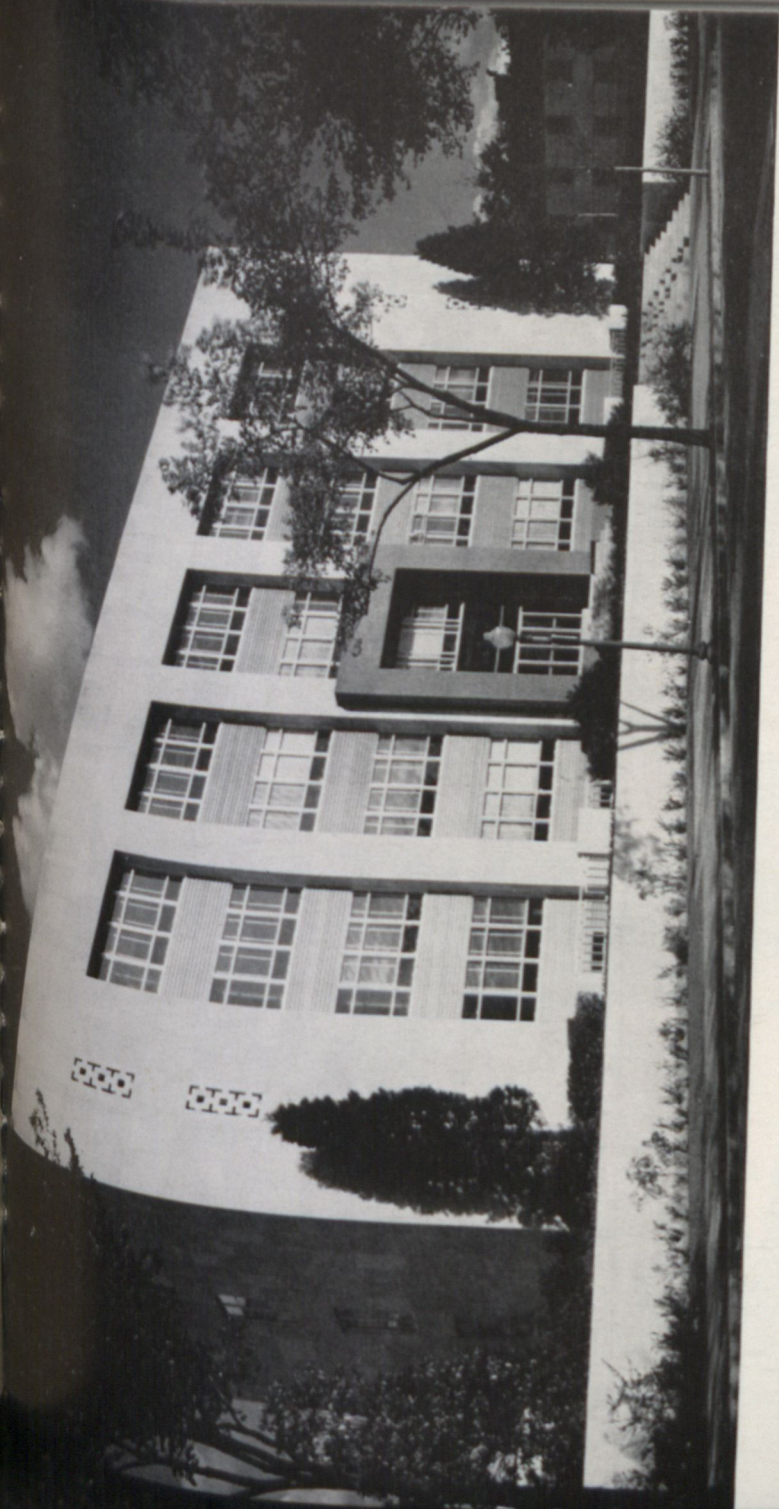
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WASHINGTON 6, D. C.

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BY THE UNIVERSITY

THE
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BULLETIN

No. 2

Vol. IX

SCHOOL OF ENGINEERING

WASHINGTON, D. C.

RECEIVED UNIVERSITY

THE UNIVERSITY

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CALENDAR

1960-61

Date	Day	Occasion
1960		
FALL SEMESTER:		
Sept. 12-21	Mon.-Wed.	Advising for freshmen, sophomores, and all new students
Sept. 15	Thurs.	Orientation assembly for all new students
Sept. 16 and 19 ...	Fri. and Mon.	Placement tests for entering freshmen
Sept. 20	Tues.	Curriculum assemblies*
Sept. 20 and 21 ...	Tues. and Wed.	Examinations to qualify for advanced courses or waive curriculum requirements
Sept. 22-24	Thurs.-Sat.	Graduate registration†
Sept. 26	Mon.	Undergraduate registration‡
Oct. 7	Fri.	Classes begin
Oct. 22	Sat.	Last day for filing in the Office of the Dean subjects of theses for Master's degrees to be conferred in February
Oct. 31	Mon.	Fall Convocation
Nov. 11	Fri.	Last day for applying in the Office of the Registrar for degrees to be conferred in February
Nov. 24-26	Thurs.-Sat.	Veterans Day. Holiday
Dec. 10	Sat.	Thanksgiving recess
Dec. 22-Jan. 2 ...	Thurs.-Mon.	Graduate Record Examination
1961		
Jan. 3	Tues.	Christmas recess
Jan. 18	Wed.	Classes resume
Jan. 20	Fri.	Last day for submitting to the Dean theses and dissertations of candidates for degrees to be conferred in February
Jan. 23-31	Mon.-Tues.	Last day of classes for the fall semester
Jan. 23-Feb. 1	Mon.-Wed.	Inauguration Day. Holiday
Jan. 26	Thurs.	Examination period
		Advising for freshmen, sophomores, and all new students
		Placement tests for entering freshmen

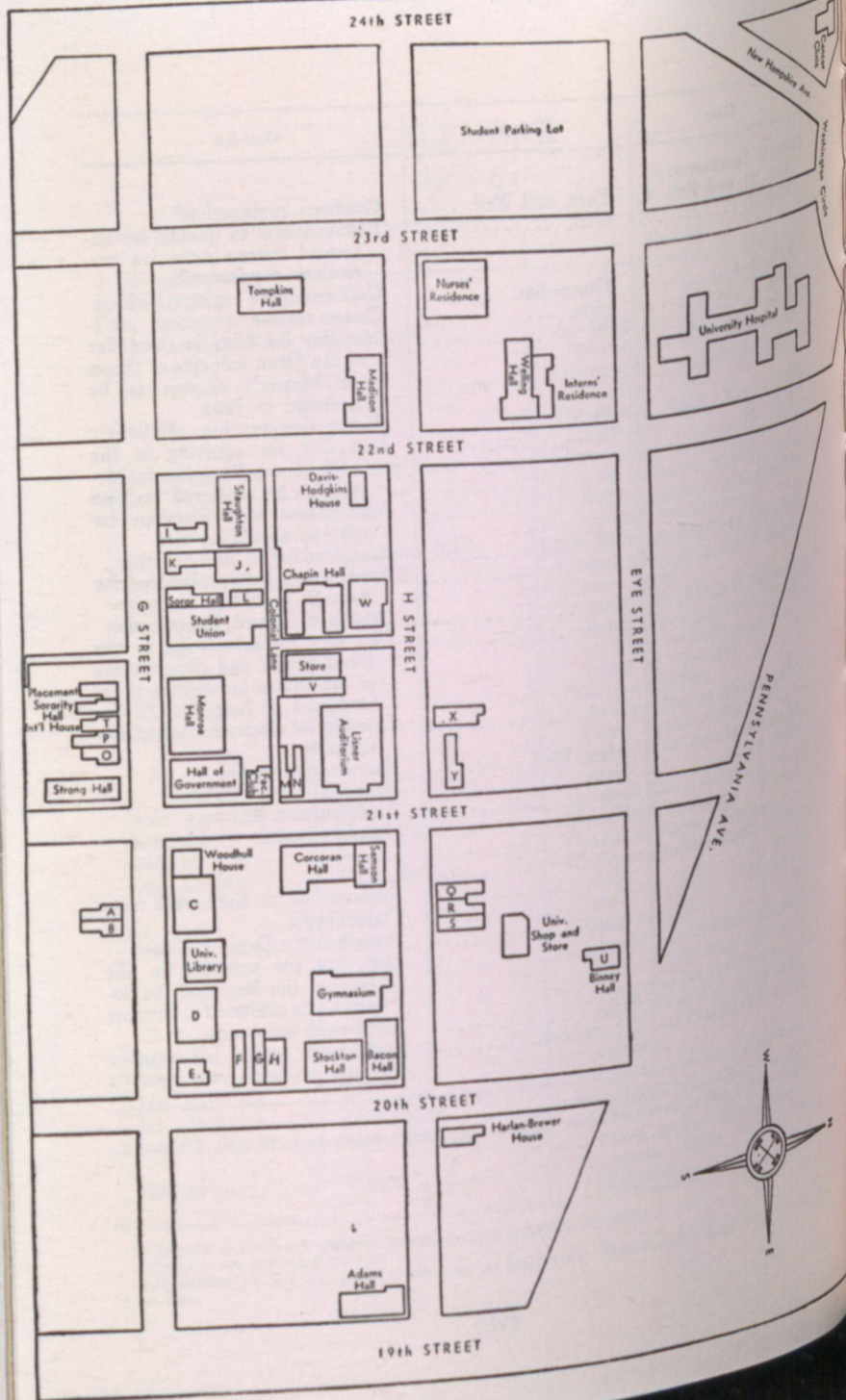
* All new students are required to attend one Curriculum Assembly.

† From 11:00 A.M. to 8:00 P.M.

‡ September 22 and 23, from 10:00 A.M. to 8:00 P.M.; September 24, from 10:00 A.M. to 1:00 P.M.

Date	Day	Occasion
SPRING SEMESTER:		
Jan. 31 and Feb. 1.	Tues. and Wed.	Graduate registration*
Feb. 1	Wed.	Examinations to qualify for advanced courses or waive curriculum requirements
Feb. 2-4	Thurs.-Sat.	Undergraduate registration†
Feb. 6	Mon.	Classes resume
Feb. 10	Fri.	Last day for filing in the Office of the Dean subjects of theses for Master's degrees to be conferred in June
Feb. 22	Wed.	Winter Convocation. Holiday
Feb. 28	Tues.	Last day for applying in the Office of the Registrar for degrees to be conferred in June
March 1	Wed.	Applications for fellowships for 1961-62 should be filed
March 31-April 5.	Fri.-Wed.	Easter recess
April 1	Sat.	Applications for scholarships for 1961-62 should be filed
April 8	Sat.	Graduate Record Examination
April 10	Mon.	Last day for submitting to the Dean theses and dissertations of candidates for degrees to be conferred in June
May 17	Wed.	Last day of classes for the spring semester
May 22-31	Mon.-Wed.	Examination period
May 30	Tues.	Memorial Day. Holiday
June 4	Sun.	Baccalaureate Sermon
June 7	Wed.	Commencement
SUMMER SESSIONS:		
June 19	Mon.	Registration for eight-week term
June 20	Tues.	Classes begin
July 4	Tues.	Independence Day. Holiday
Aug. 1	Tues.	Last day for applying in the Office of the Registrar for degrees to be conferred in October
Aug. 11	Fri.	Eight-week term ends
Sept. 21-23	Thurs.-Sat.	Registration for the fall semester of the academic year 1961-62

* From 11:00 A.M. to 8:00 P.M.
† February 2 and 3, from 10:00 A.M. to 8:00 P.M.; February 4, from 10:00 A.M. to 1:00 P.M.



THE UNIVERSITY



THE BOARD OF TRUSTEES

The Board of Trustees of the University is composed of the President of the University ex officio and the following persons by election:

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 Alan Thomas Deibert, A.M., *Adviser to Students from Foreign Countries*
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 Edward Martin Wall, A.B., LL.B., *Director of Air Science*
 John Francis Latimer, Ph.D., *Associate Dean of Faculties; University Marshal*

THE COLLEGES, SCHOOLS, AND DIVISIONS

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 Calvin Darlington Linton, Ph.D., *Dean of Columbian College*
 Arthur Edward Burns, Ph.D., *Dean and Chairman of the Graduate Council*
 John Parks, M.S., M.D., *Dean of the School of Medicine; Medical Director of the University Hospital*
 Charles Bernard Nutting, A.B., J.D., LL.M., S.J.D., LL.D., Litt.D., L.H.D., *Dean of the National Law Center (since February 1, 1960)*

* The Officers of Administration listed here are for the academic year 1959-60.
 † On leave of absence spring semester 1959-60.

Louis Harkey Mayo, B.S., LL.B., J.S.D., *Acting Dean of the Law School*
(to February 1, 1960)

Martin Alexander Mason, B.S. in Eng., Ing.-Dr., *Dean of the School of Engineering*

Charles Watson Bliven, M.S., *Dean of the School of Pharmacy*

James Harold Fox, A.M., Ed.D., *Dean of the School of Education*

Archibald Mulford Woodruff, Ph.D., *Dean of the School of Government*

Grover LaMarr Angel, A.M., Ed.D., *Dean of the College of General Studies*

Elmer Louis Kayser, Ph.D., LL.D., *Dean of the Division of University Students*

Warren Reed West, Ph.D., *Dean of the Division of Special Students*

Angus MacIvor Griffin, Ph.D., *Associate Dean of the School of Medicine*

Alvin Edward Parrish, M.D., *Associate Dean of the School of Medicine*

Victor Frederick Ludewig, A.B., B.S., *Administrator of the University Hospital*

John Gage Allee, Jr., Ph.D., *Associate Dean of the Division of University Students*

William Lewis Turner, Ph.D., *Assistant Dean of the Junior College*

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Edward Andrew Potts, A.B., LL.B., *Assistant Dean for Development in the Law School*

Carl Hugo Walther, B.E., M.C.E., *Assistant Dean in the School of Engineering*

Robert Meyer Leonard, Ph.D., *Assistant Dean of the School of Pharmacy*

Blake Smith Root, A.M., Ed.D., *Assistant Dean of the School of Education*

Joe Lee Jessup, M.B.A., *Assistant Dean in the School of Government*

Walter Harold Hayes, Jr., A.M., *Assistant Dean in the College of General Studies*

HISTORY AND ORGANIZATION

HISTORY

The idea of a university located in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

It was George Washington's hope that the "General Government" would extend toward such an institution "a fostering hand". No steps were taken by Congress to carry out the provision of Washington's will, and the stock that he had bequeathed for the establishment of a university in the District of Columbia became valueless owing to the failure of the Potomac Canal properties.

Meanwhile, however, a movement was started by private persons under the leadership of Luther Rice to establish an institution of higher learning at the seat of the National Government for the education of the Baptist ministry and to afford general collegiate training. In 1819 an association was formed by Luther Rice, Obadiah B. Brown, Spencer H. Cone, and Enoch Reynolds for the purpose of raising funds to buy land for the use of the college.

A group of the Nation's leaders who were especially interested in Washington's idea became patrons of the college and contributed to funds raised for the purchase of land and erection of buildings. Among them were James Monroe, President of the United States; William H. Crawford, Secretary of the Treasury; John C. Calhoun, Secretary of War; William Wirt, Attorney General; Return J. Meigs, Postmaster General; and thirty-two members of the Congress.

Legally to implement the college a petition was made to Congress for the incorporation of "the General Convention of the Baptist Denomination in the District of Columbia for evangelical and literary purposes". This petition was denied by Congress, on April 26, 1820, because of its sectarian character.

Failing to obtain a denominational charter, members of the association enlarged their objective to embrace national aims, and with the sponsorship of Government leaders there was presented in Congress a bill for the incorporation of "the Columbian Society for literary purposes", it being proposed to realize in this way "the aspirations of Washington,

Jefferson and Madison for the erection of a university at the seat of the federal government".

Acting upon this second petition, on February 9, 1821, Congress chartered Columbian College in the District of Columbia, inserting in the charter by special action the provision "that persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College or denied any of the privileges, immunities or advantages thereof, for or on account of his sentiments in matters of religion".

Thus Columbian College in the District of Columbia was chartered by Congress as one of the early nonsectarian institutions of higher learning in the United States, under the distinguished favor of President James Monroe and members of his Cabinet.

A tract of approximately forty-seven acres, extending about one-half mile northwest of Boundary Street (Florida Avenue) between Fourteenth and Fifteenth Streets, was purchased and by 1822 the main building was completed sufficiently to use.

Two years later, when the first Commencement was held on December 15, 1824, Congress and the Supreme Court adjourned their sessions to enable their members to attend the exercises. President Monroe, John Quincy Adams, John C. Calhoun, Henry Clay, and the Marquis de Lafayette headed the eminent company in attendance.

By an act of Congress of March 3, 1873, the name of the college was changed to "Columbian University", in recognition of the enlarged scope of the institution. In 1884 the University was moved from its first location on "College Hill", now Columbia Heights, to the new University Hall built for it at Fifteenth and H Streets. Near-by buildings accommodated the School of Medicine and, somewhat later, the Law School.

For a period of six years, from 1898 to 1904, the University was placed under control of the Baptist Denomination. In 1904 an act restoring the original secular character of the University and authorizing change of name to The George Washington University was passed by Congress.

Subsequently all the colleges, schools, and divisions of the University except the School of Medicine were brought together in the area bounded by Nineteenth, Twenty-third, and G Streets, and Pennsylvania Avenue NW. The School of Medicine is situated on H Street between Thirteenth and Fourteenth Streets NW.

The endowment of the University is \$7,500,000.

THE COLLEGES, SCHOOLS, AND DIVISIONS

The George Washington University includes fourteen colleges, schools, and divisions, as follows:

The Junior College offers the work of the first two years of the four-

year college program in the liberal arts and sciences and two years of preprofessional work. Each of these curricula leads to the degree of Associate in Arts. It also offers two-year terminal curricula. Those in Accounting and Secretarial Studies lead to the degree of Associate in Arts; those in Home Economics and Physical Sciences lead to the degree of Associate in Science.

Columbian College offers the work of the junior and senior years of the four-year college program in the liberal arts and sciences leading to the degrees of Bachelor of Arts and Bachelor of Science. In cooperation with the Department of Pathology and the University Hospital, Columbian College offers a course in Medical Technology leading to the degree of Bachelor of Science in Medical Technology. It also offers the studies leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

The Graduate Council offers a program of advanced study and research leading to the degree of Doctor of Philosophy.

The School of Medicine offers work leading to the degree of Doctor of Medicine.

The Law School offers professional and graduate courses leading to the degrees of Bachelor of Laws, Juris Doctor, Master of Laws, Master of Comparative Law, and Doctor of Juridical Science.

The School of Engineering offers courses leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering. It also offers the studies leading to the degrees of Master of Science in Engineering and Master of Engineering Administration and a program of advanced study and research leading to the degree of Doctor of Science.

The School of Pharmacy offers courses leading to the degrees of Bachelor of Science in Pharmacy and Master of Science in Pharmacy.

The School of Education offers undergraduate programs leading to the degrees of Bachelor of Arts in Education, Bachelor of Science in Home Economics, and Bachelor of Science in Physical Education, and graduate studies leading to the degrees of Master of Arts in Education and Doctor of Education.

The School of Government offers undergraduate programs of study in Foreign Affairs, Public Affairs, Accounting, Business Administration, and Statistics, leading to the degree of Bachelor of Arts in Government. Graduate work is offered leading to the following degrees: Master of Arts in Government in the fields of Foreign Affairs, Public Affairs, Economic Policy, Accounting, Business and Economic Statistics, Counseling and Psychometrics; Master of Arts in Public Administration; Master of Arts in Personnel Administration; Master of Business Administration in general business administration and in the field of Hospital Administration; and Doctor of Business Administration.

The College of General Studies supplements the adult education program of the University through its Off-Campus Division, Campus Division, and Division of Community Services.

The Division of University Students makes available courses for mature students, not candidates for degrees in this University.

The Division of Special Students makes available courses for mature students in the process of qualifying for degree candidacy.

The Division of Air Science offers a program of Air Force ROTC training which is integrated with the curricula of the colleges and schools of the University and leads to appointment as a commissioned officer in the United States Air Force Reserve.

The Summer Sessions.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another. The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The School of Engineering is on the accredited list of the Engineers' Council for Professional Development.

LOCATION

The George Washington University is in downtown Washington four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible to the University are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor, as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

GOVERNMENT

The government and general educational management of The George Washington University are vested in a self-perpetuating Board of Trustees, with the President of the University as a member ex officio. The members of the Board are named for a period of three years and are divided into three classes. The members of one class are elected at each annual meeting to fill the places of the members whose terms of office expire. Two members of each class are nominated by the Alumni Association.

THE SCHOOL OF ENGINEERING
1960-61

THE SCHOOL OF ENGINEERING

THE FACULTY AND STAFF OF INSTRUCTION*

- MARTIN ALEXANDER MASON, B.S. in Eng., Ing.-Dr., *Dean of the School of Engineering*
CARL HUGO WALTHER, B.E., M.C.E., *Assistant Dean in the School of Engineering*
JACK EDWARD WALTERS, M.S. in M.E., Ph.D., *Director, Engineering Administration Program*

EMERITUS FACULTY

- CLOYD HECK MARVIN, Ph.D., LL.D., *Doctor honoris causa of The George Washington University, President Emeritus of the University*

-
- BENJAMIN CARPENTER CRUICKSHANKS, B.S. in M.E., *Professor Emeritus of Mechanical Engineering in Residence*
FREDERICK MORRIS FEIKER, B.S. in E.E., D.Eng., *Professor Emeritus of Engineering Administration*
ROBERT GAY TRUMBULL, B.S. in C.E., *Professor Emeritus of Mechanical Engineering*

ACTIVE FACULTY AND STAFF OF INSTRUCTION

- GEORGE ABRAHAM, M.S., *Lecturer in Electrical Engineering*
WILLIAM ALDERSON, M.S. in E.E., *Lecturer in Electrical Engineering*
NORMAN BRUCE AMES, LL.B., E.E., M.S. in E.E., *Dr. sc. techn., Professor of Electrical Engineering*
GALIP MEHMET ARKILIC, Ph.D., *Associate Professor of Civil Engineering*
WILLIAM WALTER BALWANZ, B.E.E., M.S. in E.E., *Lecturer in Electrical Engineering*
HAROLD JOSEPH BARNETT, Ph.D., *Professorial Lecturer in Engineering Administration*
KENNETH SEYMOUR COLMEN, B.A.E., Ph.D., *Professorial Lecturer in Engineering Administration*

*The Staff of Instruction listed here is for the academic year 1959-60.
The President of the University, the Dean of Faculties, the Dean of the School and the Assistant Dean in the School, the Registrar of the University, the Director of Admissions of the University, the Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty.

- CHARLES HENRY CONRAD, B.S. in Arch., *Professorial Lecturer in Civil Engineering*
- PAUL ARTHUR CRAFTON, B.M.E., Ph.D., *Associate Professor of Mechanical Engineering*
- JAMES NATHANIEL DAVIS, M.S., *Professorial Lecturer in Engineering Administration*
- ROBERT LYLE DEDRICK, M.S.E., *Assistant Professor of Mechanical Engineering*
- LOUIS DEPIAN, Ph.D., *Associate Professor of Electrical Engineering*
- FREDERICK CHARLES DYER, M.B.A., *Professorial Lecturer in Engineering Administration*
- CLIFFORD DURAS FERRIS, M.S. in E.E., *Instructor in Electrical Engineering*
- RAYMOND RICHARD FOX, M.S. in C.E., *Associate Professor of Civil Engineering*
- ERNEST FRANK, B.E.E., M.S. in E.E., Ph.D., *Professor of Electrical Engineering; Executive Officer of the Department of Electrical Engineering*
- RALPH EDWARD FUHRMAN, B.S. in C.E., M.S. in Eng., D.Eng., *Professorial Lecturer in Civil Engineering*
- MARTIN AARON GARSTENS, A.M., Sc.D., *Lecturer in Engineering*
- JOHN FRANCIS GREENSLADE, B.S., M.E.A., *Assistant Professor of Engineering Administration*
- NELSON THOMAS GRISAMORE, Ph.D., *Associate Professor of Electrical Engineering*
- FRANKLIN PORTER HALL, Ph.D., *Professorial Lecturer in Engineering Administration*
- KEITH CYRIL HARDER, Ph.D., *Professorial Lecturer in Engineering Administration*
- FOREST KLAIRE HARRIS, Ph.D., *Professorial Lecturer in Electrical Engineering*
- ROBERT AARON HECHTMAN, M.S. in C.E., Ph.D., *Professor of Civil Engineering; Executive Officer of the Department of Civil Engineering*
- LAURENCE HEILPRIN, Ph.D., *Professorial Lecturer in Engineering Administration*
- ROBERT ALEXANDER HEMMES, M.S., *Assistant Professor of Civil Engineering*
- HERMAN HEDBERG HOBBS, Ph.D., *Associate Professor of Physics*
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- IRVING KOROBKIN, B.M.E., M.S. in M.E., *Lecturer in Mechanical Engineering*

- ROBERT STEVEN LEDLEY, D.D.S., A.M., *Assistant Professor of Electrical Engineering*
- THOMAS PHILLIP GEORGE LIVERMAN, Ph.D., *Associate Professor of Mathematics*
- KERMIT MILTON LOVEWELL, B.S. in E.E., *Lecturer in Electrical Engineering*
- MARTIN ALEXANDER MASON, B.S. in Eng., Ing.-Dr., *Professor of Civil Engineering; Dean of the School of Engineering*
- FLORENCE MARIE MEARS, Ph.D., *Professor of Mathematics*
- MELVIN RAYMOND MEYERSON, M.S. in Met.E., *Professorial Lecturer in Civil Engineering*
- JAMES RUSSELL MILES, SR., A.B., M.E.A., *Lecturer in Engineering Administration*
- ROBERT EMERSON MOFFAT, B.S. in C.E., M.C.E., *Lecturer in Civil Engineering*
- MORROW HARRIS MOORE, JR., M.S. in M.E., *Assistant Professor of Mechanical Engineering*
- ROBERT HAMILTON MOORE, Ph.D., *Professor of English Composition*
- PHILIP SIDNEY MORGAN, JR., B.S., M.S. in M.E., *Assistant Professor of Mechanical Engineering*
- ALBERT CHRISTIAN MURDAUGH, B.S., M.S. in Met.E., *Associate Professor of Mechanical Engineering*
- CHARLES RUDOLPH NAESER, Ph.D., *Professor of Chemistry*
- GEORGE PIDA, B.E.E., *Lecturer in Electrical Engineering*
- ROBERT WILLIAM PINNES, M.M.E., *Lecturer in Mechanical Engineering*
- FRANK JOSEPH POWELL, M.S., *Lecturer in Mechanical Engineering*
- FRANK MILLER REYNOLDS, LL.M., B.S., *Professorial Lecturer in Engineering Administration*
- DERRILL CONWAY ROHLFS, B.E.E., M.S. in Eng., *Associate in Electrical Engineering*
- LOUIS SAMUEL ROTOLO, B.S. in E.E., *Lecturer in Electrical Engineering*
- LEWELLYN ADAM RUBIN, B.S. in E.E., M.S. in E.E., *Assistant Professor of Electrical Engineering*
- ROBERT IRVING SARBACHER, Sc.D., E.E., *Professorial Lecturer in Engineering Administration*
- PETER HANS SAWITZ, M.S. in E.E., *Lecturer in Electrical Engineering*
- DWIGHT EDWARD SHYTLE, *Lecturer in Electrical Engineering*
- LEWIS SLACK, Ph.D., *Professor of Physics*
- WALDO EDWARD SMITH, B.E. in C.E., M.S. in C.E., *Professorial Lecturer in Civil Engineering*
- WILLIAM RUTHVEN SMITH III, B.S., B.E.E., M.S. in Eng., *Associate in Electrical Engineering*
- NATHANIEL STEWART, M.S., Ed.D., *Professorial Lecturer in Engineering Administration*

- HOWARD LIVINGSTON STIER, Ph.D., *Professorial Lecturer in Statistics (Engineering Administration Program)*
 SANFORD THOMPSON, Ph.D., *Professorial Lecturer in Mechanical Engineering*
 BOONE DOUDY TILLET, LL.B., M.S., Sc.D., *Associate Professor of Engineering Administration*
 GEORGE TYLER, Ph.D., *Professorial Lecturer in Engineering Administration*
 JACK EDWARD WALTERS, M.S. in M.E., Ph.D., *Professor of Engineering Administration; Director, Engineering Administration Program*
 CARL HUGO WALTHER, B.E., M.C.E., *Professor of Civil Engineering; Assistant Dean in the School of Engineering*
 GEORGE CALVIN WEAVER, M.S., *Associate Professor of Mechanical Engineering*
 *DAVID GOVER WHITE, B.Chem.Eng., Ph.D., *Associate Professor of Chemistry*
 ROBERT JAMES WILSON, A.M., Ed.D., *Professorial Lecturer in Engineering Administration*

ASSISTANTS IN INSTRUCTION

- SOLOMON SIDNEY FINEBLUM, B.M.E., *Graduate Teaching Assistant in Mechanical Engineering*
 FEDERICO MANNS RUDLOFF, Ing., C.E., *Graduate Teaching Assistant in Civil Engineering*
 GEOFFREY UMIO UYEHARA, A.B., *Graduate Teaching Assistant in Electrical Engineering*

ADMINISTRATIVE ASSISTANTS

- Gladys May Lacey, *Secretary to the Dean*
 Mary Shields Sobota, *Secretary*
 MarJean Klenda, *Clerk-Typist*
 Ola June Clifton, *Clerk-Typist*

COMMITTEES†

THE DEAN'S COUNCIL‡

- 1961: R. A. Hechtman, C. R. Naeser; 1962: A. C. Murdaugh, J. E. Walters; 1963: P. A. Crafton, N. T. Grisamore

* On sabbatical leave spring semester 1959-60.

† The Dean of the School and the Assistant Dean in the School are members ex officio of all committees. Membership of committees listed here is for the academic year 1959-60.

‡ Elected by the Faculty.

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C. H. Walther (*Chairman*), R. R. Fox, P. S. Morgan, Jr., L. A. Rubin

COMMITTEE ON SCHOLARSHIP

G. C. Weaver (*Chairman*), N. B. Ames, R. A. Hemmes, M. H. Moore, Jr.

COMMITTEE ON GRADUATE STUDIES*

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COMMITTEE ON RESEARCH

N. T. Grisamore (*Chairman*), G. M. Arkilic, R. L. Dedrick, R. S. Ledley, A. C. Murdaugh

GENERAL INFORMATION

INTRODUCTORY

The School of Engineering was organized October 1, 1884 as the Corcoran Scientific School of Columbian University and was situated in the University Building then at 15th and H Streets, NW. The school was named in honor of William W. Corcoran, Trustee and President of the Corporation from 1869 to 1888. Day and evening courses were offered in Literature, Science, and Technology and led to the degrees of Bachelor of Science, Civil Engineer, Mechanical Engineer, and Mining Engineer. The School was among the first to accept women for degree candidacy in engineering.

In 1903 the Corcoran Scientific School, the School of Graduate Studies, and the Columbian College were merged into a single Department of Arts and Sciences. Engineering degrees were made graduate in character and the student was required to hold a Bachelor of Science degree as a prerequisite to entrance. An indication of the developing character of the School is found in the entrance requirements which stated that "The candidate must give evidence he has completed a liberal undergraduate course—which was of such character as to fit him to pursue to advance the study of advanced engineering subjects".

Administrative changes led to The Washington College of Engineering being initiated in 1905 as one of the several semi-independent undergraduate colleges of the University, each with its own Board of Trustees. The College provided instruction leading to undergraduate degrees in engineering and architecture.

* Appointed by the Dean upon recommendation of the Faculty.

In 1909 the name of the College was changed to the College of Engineering and Mechanic Arts, and the curricula were revised to give the student a thorough understanding of the theory underlying engineering practice. Emphasis was placed on the development of a knowledge of scientific principles upon which the student could build and by which he might solve new problems as they are met in practice.

The name of the school was changed again in 1914 to the College of Engineering and later to the School of Engineering. Architecture was dropped from the curriculum and degrees were limited to the field of engineering. However, the primary emphasis upon principles rather than technology which had characterized the School since 1903 was continued and has remained to this day as one of the important distinguishing features of the School.

The location of the School of Engineering in the nation's capital makes available a group of outstanding engineers and scientists as lecturers. It is traditional for the School to include these eminent professional specialists among the staff of instruction.

Since 1884 courses of instruction have been open to both men and women.

OBJECTIVE

The objective of the School of Engineering is to produce graduates who possess knowledge and understanding of the fundamental scientific principles in their fields of study; some skill in their application; and an attitude of responsibility toward society and the engineering profession.

ORIENTATION PROGRAM *

Students in the School of Engineering participate in the Orientation Program of the University, which is held during the week preceding registration for the fall semester. Events of the program include an advising period when members of the Faculty and academic advisers in the School of Engineering are available for personal interviews to assist students in planning their programs to best prepare them for ultimate goals; an Orientation Assembly, required of all new students; a Curriculum Assembly, for guidance in the selection of courses for the coming semester; placement tests for new students who do not have advanced standing in mathematics and English; qualifying examinations for students who wish to waive curriculum requirements or qualify for advanced standing; scheduled social events; and the opportunity to discuss with older students and with staff members concerned with student activities the extracurricular program of the University, so that a wise and rewarding selection may be made.

* See the calendar for dates of scheduled events.

The placement tests are required and are scheduled during Orientation week for students entering the School of Engineering, and again during the week prior to the spring registration for students entering at that time, so that the results will be available to students and advisers before registration as a guide to class placement. Students shown by the results of placement tests to be inadequately prepared are advised to take remedial work before undertaking Engineering curriculum courses in areas of deficiency.

PROGRAMS OF STUDY

Programs of undergraduate study are offered leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering (with optional areas of concentration).

Graduate work is offered under the supervision of the Committee on Graduate Studies, leading to the degrees of Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

HOURS OF INSTRUCTION

Courses of instruction are scheduled in the morning, afternoon, and evening. By taking the evening and summer classes and extending the time of study beyond the customary four years, a student who is able to give only part of his time to college work may complete a regular course and obtain a degree.

VETERANS EDUCATION

The Office of Veterans Education of The George Washington University operates as a service bureau for veterans interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration. Eligible persons are advised to consult this Office concerning the educational program of the University and the procedure for securing educational benefits before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D. C.

PUBLIC LAW 634

(War Orphans' Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the

case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

PUBLIC LAW 190

(World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1956, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

PUBLIC LAW 550

(Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950 and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

PUBLIC LAWS 16 AND 894

(Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to the Veterans Administration for approval of their training objectives at least sixty days prior to registration.

SERVICE SCHOOL CREDITS

A limited amount of credit earned in service schools since 1941 may be considered for assignment to qualified degree candidates in the Junior College, Columbian College, the School of Engineering, and the School of Government. Veterans should submit to the Director of Admissions photostatic copies of their service school records, indicating courses successfully completed with sufficient identification of the course to locate it in the Guide to Evaluation of Educational Experience in the Armed Forces.

AIR FORCE RESERVE OFFICERS' TRAINING CORPS

The Air Force Reserve Officers' Training Corps (Air Force ROTC) unit was established at the University in 1951 under authority of Sec-

tion 40-47C, National Defense Act of June 3, 1916, as amended. Air Force personnel, approved by the President of the University, are assigned by the Department of the Air Force to supervise and conduct the Air Force ROTC program.

The mission of the Air Force ROTC is to develop in selected university students, through a permanent program of instruction, those qualities of leadership and other attributes essential to their progressive advancement to positions of increasing responsibility as commissioned officers in the United States Air Force. Classroom instruction and leadership training are provided to develop in the student the knowledge and the attributes of character, personality, and leadership required of commissioned officers.

COURSE OF STUDY

The course of study is divided into the basic course covering the first two years and the advanced course covering the junior year, summer training unit, and senior year.

The program takes into consideration the fact that many of the academic subjects in which college students are enrolled have a direct relationship to military as well as to civilian careers. The courses of the Air Force ROTC program have been carefully selected to supplement those academic subjects. They also afford a means for practical training in organization, leadership, and discipline, which will be of value in industrial or professional careers. The duties and responsibilities of commissioned officers, oral and written expression, and the techniques of problem solving are emphasized throughout the course both in theory and practice.

Cadets in the advanced course receive subsistence allowances from the Government totaling approximately \$500, which is exempt from income tax. During the period of summer training, cadets receive \$75 a month, food, lodging, and travel expense. Uniforms, textbooks, and training materials are provided for all Air Science courses at no expense to the cadet. In addition thereto, orientation flights and field trips to Air Force bases are available to selected cadets on a voluntary basis.

ELIGIBILITY REQUIREMENTS

Enrollment in the Division of Air Science basic course is open to all men students and a limited number of women students, who are at least 14 years of age, physically fit, of good character, and candidates for a Bachelor's degree. Men students enrolling in the basic course are required to successfully complete the two-year course as a prerequisite to graduation from the University. Upon successful completion of the basic course, a cadet may apply for enrollment in the advanced course.

A cadet enrolling in the advanced course obligates himself to successfully complete the course, and upon graduation to accept a commission, if tendered, in the United States Air Force. Any cadet who for academic, physical, or other reasons becomes disqualified for a commission is relieved of this obligation. Cadets enrolled in the category leading to pilot training may be required to pursue a 35 hour course of flying instruction during the senior year. This flying instruction is provided by a Federal Aeronautics Administration approved school at government expense, and leads to qualification for a private pilot's certificate.

MILITARY SERVICE DELAY

Deferment from induction under the Selective Service Act of 1951 may be granted to selected cadets within authorized quotas. Normally, a cadet is not considered for draft deferment until he has completed one semester's work in the University, with a quality-point index of at least 2.00. A cadet's deferment is subject to withdrawal if his quality-point index falls below 2.00.

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M., with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) the physical examination of every student entering from secondary school;* (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration. All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit does not apply to illness or disability incurred previous to the University term or prior to payment of tuition fees.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

* A charge of \$2 for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for the purpose.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) the above regulations apply also during the summer term of the University.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of physical education.

LIVING ACCOMMODATIONS

The University maintains four residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance (for the fall semester by May first, for the spring semester by January first). Forms for application, together with detailed information, may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls (except freshmen) under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives, may live outside the dormitories only with the permission and approval of the Director of Activities for Women, upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Freshman girls may be domiciled outside the dormitory only with their parents or with immediate relatives with the written approval of their parents.

Women Students—The Hattie M. Strong Hall provides single rooms at \$42.50 a month and double rooms at \$37.50 a month a person.

The Dolly Madison Hall provides double rooms at \$37.50 a month a person.

Men Students—Welling Hall provides double rooms at \$30 a month a person.

The John Quincy Adams Hall provides 69 double rooms each with study alcove and bath. Rooms rent at \$40 a month a person.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor these groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

UNIVERSITY CHAPEL

The University Chapel is maintained as a nonsectarian service of worship for the University community. The service is held Wednesday of each week from 12:10 to 12:30 o'clock at 1906 H Street NW. Among the guest speakers are representative clergymen of Washington. The Director of Chapel is available for counseling on personal problems.

THE PLACEMENT OFFICE

The Placement Office, 2114 G Street NW., provides assistance to students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration.

Students and alumni interested in placement are asked to register in person at the Office and to select from written descriptions of current openings positions for which they wish referral. Those interested in planning careers are invited to study the information on career fields and the brochures of business and industrial organizations, government agencies, etc., which are on display in advance of campus visits by recruiting officers. The services of the Counseling Center are available to students and alumni wishing career guidance.

The Placement Office is open from 9:00 A.M. to 5:00 P.M., Monday through Friday.

THE TESTING AND COUNSELING CENTER

The Testing and Counseling Center, 718 Twenty-first Street NW., offers services which are available to students enrolled in the University, to high school students, and to adults of the community.

The services are designed to assist individuals in the evaluation of their educational and vocational potentialities and objectives, diagnose

academic difficulties, provide educational and vocational literature and information, and refer individuals to qualified agencies for assistance with problems not handled by the Center.

The Center provides special testing services including: diagnostic tests prescribed by the School of Engineering, admissions tests for the University and for other educational institutions, and tests for business and industry.

Fees.—Except for specialized testing, the fee covers testing and counseling based on the results of the tests. For students who are currently registered as degree candidates in the University, the fee is \$7.50; for students currently enrolled in the University but not as degree candidates, the fee is \$30; for graduates of The George Washington University, \$30; for community clients under twenty-one years of age, \$35; for community clients twenty-one or over, \$45. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Center.

STUDENT UNION

The Student Union, 2125 G Street NW., is the center for student life. From the cafeteria on the first floor to the reading room on the fourth floor, it is well planned to meet the students' need for meals, study, recreation, and activities. In addition to the recreation lounge and social lounge the Student Union provides office space for the Student Council and for the other major student organizations.

The Student Activities Office, also in the Student Union, has available information concerning the student organizations and campus events.

DAVIS-HODGKINS HOUSE

The Davis-Hodgkins House, 731 Twenty-second Street NW., is the engineering student center, providing lounges, reading rooms, and student organization offices. The House provides convenient, comfortable facilities for the exchange of ideas and good fellowship among student engineers.

INTERNATIONAL HOUSE

The International House, 2110 G Street NW., is the social center for students from foreign countries. A series of teas, dances, and other forms of entertainment, and the use of club rooms and lounge enable students to become acquainted and feel at home in the University.

The International Students' Society welcomes as members students from other lands as well as North American students.

The Adviser to Students from Foreign Countries, whose office is in International House, is available for advice and guidance.

STUDENT ACTIVITIES

DIRECTORS OF STUDENT ACTIVITIES

The University maintains the offices of the Director of Activities for Men and the Director of Activities for Women, for the guidance of students in all nonacademic phases of student life, such as student activities, social life, and housing. The directors are available for individual counseling concerning personal adjustment to university life.

STUDENT GOVERNMENT

Student Council.—The University believes in encouraging the development of the sense of civic responsibility in its students by delegating to them such authority in student activities as is consistent with established policy and regulations. To this end, the organization of the University includes the Student Council, which, under the guidance of the Directors of Student Activities, is responsible for the conduct of all student activities. The Student Council is elected annually by the student body.

Committee on Student Life.—The Committee on Student Life is the judicial branch of the student government. It is composed of not more than seven members of the faculty, two of whom are the Director of Activities for Men and the Director of Activities for Women, appointed by the President of the University, and the following members: President of Student Council, an Editor of the *Hatchet*, President of Mortar Board, President of Omicron Delta Kappa, President of the Interfraternity Council, and President of Panhellenic Council. This Committee has the power to review the acts of all student organizations, including the Student Council, and set aside acts that are contrary to established policy and regulations of the University or the Committee.

Approval of Student Organizations.—This Committee is granted authority to approve or disapprove the establishment of any proposed organization on campus. No student club or society (except social fraternities, sororities, scholastic honor societies, religious or professional clubs or societies) organized as a branch or affiliate of a non-George Washington University organization will be recognized by the Committee on Student Life.

ELIGIBILITY FOR STUDENT ACTIVITIES

Any student registered in The George Washington University is eligible to participate in nonathletic student activities of the University; however, a student having a scholastic average of less than 2.00 is not eligible to be:

1. A member of the Band, Dance Production groups, Enosinian Debate Society, Glee Club, Cheerleaders, Student Council, Religious Council, Panhellenic Council, Interfraternity Council, Engineers' Council, Student Life Committee, Adams Hall Council, Madison Hall Council, Strong Hall Council, or any publications staff
2. An officer, permanent committee chairman, or member of the executive board of any activity.

The rules and policies of the Southern Conference govern participation in intercollegiate athletics.

THE ENGINEERS' COUNCIL

The Engineers' Council is the student governing body for the School of Engineering, composed of two elected representatives from each year class and from the graduate student body, one representative from each student organization in the School, the Business Manager of the *Mecheleciv*, and the House Manager of the Davis-Hodgkins House. The purpose of the Council is to provide liaison between the student body of the School of Engineering and the Faculty, Administration, and Student Government of the University in all matters affecting the general interests and welfare of the student body, the School of Engineering, or the University. The Council is maintained financially by the Engineers' Council Fee paid by each student in the School of Engineering, and sponsors and engineers' student magazine, *Mecheleciv*; the Annual Engineers' Mixer, Engineers' Banquet and Ball, and the Annual Christmas Tree Ceremony in the University Yard. Council meetings are open to all students in the School of Engineering.

The Council acts as the directing body for *Mecheleciv*, the engineers' student magazine. The magazine is published six times a year and is sent free to all engineering students. It includes campus and alumni news, a calendar of events, news of the student organizations, and articles on engineering by students and faculty members. The magazine is published by a student Board of Editors and a volunteer student staff.

The control and administration of all student activities are outlined in a separate bulletin.

SPORTS ACTIVITIES

The University is a member of the Southern Conference and the National Collegiate Athletic Association. Its teams participate in intercollegiate contests in football, basketball, baseball, tennis, golf, rifle, sailing, and crew.

The University maintains a complete program of intramural sports

for both men and women. The men's program is conducted by the Intramural Council. The Women's Athletic Association and Interscholastic Athletic Board cooperate with the departments of Physical Education in conducting the women's intramural and informal extra-mural sports program in tennis, hockey, basketball, rifle, swimming, golf, bowling, and badminton.

ARTS

The University offers an opportunity for interested students to participate in dance, drama, forensics, and music through the following organizations: Dance Production Groups I, II, III; Enosinian Debate Society; University Dramatic Production Group; and University Glee Club. Each of these groups presents programs during the academic year.

With the cooperation of the Curator of Art, an annual student art exhibit is presented.

SCHEDULED EVENTS

Colonial Program.—The Student Council sponsors a series of ten cultural programs to which all students are invited.

Recreation Program.—The Student Council and the Dance Production Groups arrange dances—square, folk, and social—at frequent intervals for all students.

Engineers' Mixers.—At the beginning of each semester the Engineers' Council sponsors a program of orientation, good fellowship, and entertainment to introduce new students.

Homecoming.—Scheduled about the middle of the fall semester, Homecoming is the primary festive period of the school year. It includes the annual Pep Rally and Variety Show, the homecoming football game, and the homecoming dance.

Religion in Life Week.—Observed during the week of Thanksgiving, Religion in Life Week includes special lectures, classroom lectures, and fraternity and sorority discussion groups. Religion in Life Week is sponsored by University Chapel in cooperation with the Committee on Religious Life and the religious organizations.

Holiday Season.—The University traditionally greets the holiday season with appropriate ceremonies including the lighting of the Christmas tree (given and decorated by the School of Engineering), the singing of Handel's Messiah, and the observance of a special Christmas service at the University Chapel.

Engineers' Banquet.—In the spring the Engineers' Council sponsors the Engineers' Banquet and Ball, a social event for students and alumni, featuring recognition of student achievements during the year.

Career Conference.—Under the sponsorship of the Student Council, guest speakers from many professions explore annually with students the potentialities of vocations available on graduation.

May Day.—This is the traditional time for the award of honors in student activities. Mortar Board and Omicron Delta Kappa announce and present their new members.

The Colonial Cruise.—An afternoon and evening cruise on the Potomac in the late spring. Students, alumni, and faculty picnic, dance, and engage in games and athletic contests.

STUDENT ORGANIZATIONS

HONOR SOCIETIES

Sigma Xi.—A national scientific honor society, the purpose of which is to encourage original investigation in science pure and applied. Outstanding graduate students in the sciences are eligible for full membership, and undergraduates who have shown marked ability in research may be elected to associate membership.

Omicron Delta Kappa.—A national fraternity emphasizing leadership in extracurricular activities.

Order of Scarlet.—A service honorary society for sophomore and junior men.

Phi Eta Sigma.—A national fraternity, established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman men who attain a scholastic average of at least 3.50.

Sigma Tau.—A national engineering fraternity, the purpose of which is to recognize scholarship and professional attainment.

PROFESSIONAL ORGANIZATIONS

American Society of Civil Engineers (Student Chapter).—Membership open to students who are candidates for a civil engineering degree or the degree of Bachelor of Science in Engineering.

American Institute of Electrical Engineers—Institute of Radio Engineers (Student Chapter).—Membership open to candidates for an electrical engineering degree.

American Society of Mechanical Engineers (Student Chapter).—Membership open to candidates for the degree of Bachelor of Mechanical Engineering.

Theta Tau (Gamma Beta Chapter).—A national professional (engineering) fraternity. Membership by invitation to outstanding students who have completed successfully at least the freshman year in the School of Engineering.

SOCIAL FRATERNITIES

Sigma Chi, Kappa Sigma, Phi Sigma Kappa, Sigma Alpha Epsilon, Sigma Phi Epsilon, Phi Alpha, Sigma Nu, Acacia, Tau Kappa Epsilon, Pi Kappa Alpha, Tau Epsilon Phi, Alpha Epsilon Pi, Delta Tau Delta, Kappa Alpha.

SOCIAL SORORITIES

Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Kappa Delta, Phi Sigma Sigma, Zeta Tau Alpha, Kappa Kappa Gamma, Delta Gamma, Kappa Alpha Theta, Alpha Epsilon Phi.

RELIGIOUS ORGANIZATIONS

Baptist Student Union, B'nai B'rith Hillel Foundation, Canterbury Association, Christian Science Organization, Eastern Orthodox Club, Lutheran Student Association, Newman Club, Religious Council, Student Christian Fellowship, Unitarian Club, United Christian Fellowship, Wesley Foundation.

STUDENT PUBLICATIONS

Amicus Curiae (Law School publication), *The Cherry Tree* (the annual), *The University Hatchet* (weekly newspaper), *The George Washington Law Review*, *Mecheleciw* (engineers' publication), *The Percolator* (pharmaceutical publication).

OTHER ORGANIZATIONS

Adams Hall Council, Alpha Theta Nu (scholarship winners), Big Sisters, Cheerleaders, Colonial Boosters, Current Events Club, Flying Sponsors, Interfraternity Council, Interfraternity Pledge Council, Inter-law Fraternity Council, International Relations Club, International Students' Society, Junior Panhellenic Association, Madison Hall Council, Old Men, Senior Panhellenic Association, Strong Hall Council, Student Council, Student Legal Aid Society, University Band, Wandering Greeks, Writers' Club.

ADMISSION

The School of Engineering accepts men and women. Students may enter at the beginning of the fall semester, the spring semester, or the Summer Sessions.

APPLICATION FOR ADMISSION

An applicant for admission must obtain from the Office of the Director of Admissions of the University an application blank which he must fill out completely and return with the application fee of \$10 if applying as a degree candidate, \$5 if applying as a nondegree candidate. A recent photograph, with signature, of the applicant must be attached to the blank.

Applications should be filed not later than July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions.

An applicant from a secondary school must send the high school record form provided by the University to his high school principal with the request that the principal fill out the form and mail it *directly* to the Office of the Director of Admissions.

The applicant must request the College Entrance Examination Board to send to the Office of the Director of Admissions the scores of all College Entrance Examination Board Scholastic Aptitude tests and Achievement tests taken. Arrangement for tests is the responsibility of the applicant and should be made with the College Entrance Examination Board, 20 Nassau Street, Princeton, New Jersey, not less than one month before the date of the test. On the application for the test, the student should specify that the scores be sent to the Director of Admissions, The George Washington University, Washington 6, D. C.

An applicant who has previously attended an institution of higher learning must request the registrar of that institution to mail directly to the Office of the Director of Admissions a transcript of his record. If he has attended more than one such institution he must request the registrar of each institution to send to the Office of the Director of Admissions a transcript of his record, *even though credits were not earned*, together with an honorable dismissal from the institution last attended.

The Graduate Record Examination administered by the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey, is accepted as supplemental evidence of the educational attainments of the applicant for graduate study, and the appropriate report should accompany the application for admission whenever available.

APPLICATION FOR READMISSION

A student who has previously registered in the University, but who has not been in attendance during the semester prior to registration (summer session excluded) must file an application for readmission in advance of registration. If the student is seeking readmission as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must file in the Office of the Director of Admissions complete and official transcripts of record from each institution attended before his application

may be considered. All applications for readmission are considered on the basis of regulations effective for the specific semester in which the applicant seeks to enter.

ENTRANCE REQUIREMENTS

The applicant for undergraduate or graduate work must be of good character and must have had academic background appropriate for the program of studies contemplated.

FOR UNDERGRADUATE STUDY

For the Degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering.—Consideration for admission is based upon the combined evidence of the following factors:

1. An acceptable certificate of graduation from an accredited secondary school showing a minimum of fifteen "units" *
2. The principal's statement that the applicant is adequately prepared to undertake college work with reasonable prospect of success
3. Scores on the Scholastic Aptitude Test of the College Entrance Examination Board, which is required.

The Committee on Admission and Advanced Standing will consider the adequacy of the qualifications for academic success of an applicant who, because of unusual circumstances, does not present all of the formal requirements stated above. The Committee may prescribe appropriate tests when necessary.

Nine and one-half of the fifteen units required for entrance must be distributed as follows: three in English, two in algebra, one in plane geometry, one-half in plane trigonometry, one in physics or chemistry, and two in one foreign language or history. A graduate of an approved high school who does not offer for admission the particular subjects required for the engineering curriculum, but who does present not less than fifteen acceptable units, may be admitted on condition, if such deficiency in the distribution of units does not exceed two units.

It is recommended that *both* physics and chemistry be studied in high school. Study of these sciences contributes to the student's general education, aids in his choice of a career, and affords a qualitative measure of his ability and potential for engineering study. Superior students are encouraged to begin collegiate study of physics or chemistry at the highest level consistent with their preparation, by the use of waiver examinations.

The study of solid geometry is recommended, in order that the stu-

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

dent may present a firm foundation for his collegiate studies in mathematics.

Advanced Standing

Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be assigned by the School of Engineering to the extent that the work taken at previous institutions meets the requirements for the degree sought at this University, and subject to the general University regulations concerning satisfactory subsequent work.

FOR GRADUATE STUDY

For regulations concerning admission to graduate study toward the degrees of Master of Science in Engineering and Master of Engineering Administration, see page 55; toward the degree of Doctor of Science, see page 60.

For Degree Candidacy

For regulations concerning admission to candidacy for the Master's degrees, see page 55.

REGISTRATION

Before a student may be admitted to registration he must have satisfied the Office of the Director of Admissions that he is qualified to enter the University.

A student who has previously matriculated in the University, but who has not been in attendance during the semester prior to registration, must file an application for readmission in advance of registration.

Registration is for the semester unless otherwise indicated on the registration paper. No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in the School of Engineering and in another institution or another division of The George Washington University without the permission of the Dean. Allowance of credit for work done concurrently will be at the discretion of the Committee on Admission and Advanced Standing.

Registration in the School of Engineering entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library facilities, except as otherwise designated; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to *Mecheleciv*, the

engineers' student magazine; (7) subscription to the *University Hatchet*, the student newspaper; (8) admission to University debates; (9) medical attention and hospital services as described under Health Administration, pages 22-23. These privileges, with the exception of the issuance of transcripts, terminate, and a student is no longer a residence, when he withdraws or is dismissed from the University.

FEEES AND FINANCIAL REGULATIONS

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	\$10.00
Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable	5.00
Tuition Fees:	
For each semester hour for which the student registers (except for courses in Departments of Instruction in the School of Engineering, for courses in the College of General Studies Off-Campus Division, and for work toward a Master's degree in Engineering)	22.00
For each semester hour for which the student registers for courses in Departments of Instruction in the School of Engineering	24.00
For the degree of Master of Engineering Administration:	
For work leading to and including the Comprehensive Examination*	700.00
For the degree of Master of Science in Engineering:	
For work leading to and including the Comprehensive Examination*	800.00
For the degree of Doctor of Science:	
For work leading to and including the Qualifying Examination	1,200.00
For work leading to and including the final examination	1,200.00
For work leading to and including the final examination	25.00
Graduation fee	6.00-12.00
Admission Tests (when required)	
Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree at the time of registration for the final semester	7.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program involving one or more than one course	2.00
Withdrawal fee, charged each student who preregisters and withdraws prior to the regular registration	5.00
Service fee, charged each student for late payment of tuition	2.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees	5.00
Residence fee,† charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements	24.00

* When a limited schedule is carried which extends the time of completion of the program of study to more than one year, a proportionate part of the charge may be fixed by the Treasurer.

† Candidates for the Master's degrees who have paid in full the fee for work leading to and including the Comprehensive Examination but whose Comprehensive Examinations have not been completed will be granted one semester without payment of residence fee.

For special physical examination	2.00
Engineers' Council fee, charged each student in the School of Engineering for each semester or any part thereof except the summer term	1.50
For each examination to qualify for advanced standing and for each special examination	5.00
Laboratory checkout fee, charged each student in chemistry courses who fails to check out of the laboratory by the time set by the instructor ..	3.00
Transcript fee, charged for each transcript of record after the first	1.00

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

In exceptional cases, subject to the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

A student who fails to meet payments when due, but who pays his fees within the following two weeks of the date on which payment is due, is charged a service fee of \$2. A student who fails to meet payments within these two weeks after payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of \$5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

*The University work week is Monday through Friday, inclusive.

WITHDRAWALS AND REFUNDS

Application for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean. Notification to an instructor is not an acceptable notice.

For regulations governing students in the School of Engineering concerning withdrawal without academic penalty, see page 45.

A student may not withdraw from either the basic course (2 years) or the advanced course (2 years) of the Air Force ROTC without the approval of the President of the University.

In authorized withdrawals and changes in schedules, financial adjustments will be made as follows:

Fall Semester.—Withdrawal dated on or before the last working day* in October, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in November, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in November.

Spring Semester.—Withdrawal dated on or before the last working day* in February, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in March, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in March.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and is cancelled before the regular registration day. In this case a withdrawal fee of \$5 is charged and tuition fees refunded. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

Any student in chemistry who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a checkout fee in the amount of \$3. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Any student enrolled in the Air Force ROTC who fails to turn in uniforms, equipment, and textbooks on separation from the Corps will be charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

* The University work week is Monday through Friday, inclusive.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

SCHOLARSHIPS, PRIZES, FINANCIAL AID

SCHOLARSHIPS

Scholarships are awarded for the academic year unless otherwise specified and are credited in equal parts for each semester. Each holder must carry the full prescribed schedule during the period for which the scholarship is awarded. Except in the case of the School of Engineering Scholarships, the General Motors College Scholarship, the Eugene and Agnes E. Meyer Scholarships, and the Texaco Scholarship, the applicants must have established an academic record in courses at this institution, and should apply on prescribed forms which must be filed in the Office of the Chairman of the Committee on Scholarships not later than April 1 preceding the academic year for which the scholarship is to be awarded. Complete information concerning Fellowships, Scholarships, Prizes, and Financial Aid is contained in a separate issue of the University BULLETIN which is available at the Office of the Director of Admissions.

Association of Federal Communications Consulting Engineers Scholarship.—This scholarship, which includes tuition, laboratory fees, and books, established in 1958 by the Association of Federal Communications Consulting Engineers (AFCCE), is available to a student of good character, promise, and leadership pursuing a course of study leading to a Bachelor of Electrical Engineering degree and intending to major in communications.

Frederick Albert and Alma Hand Britten Scholarships.—These scholarships, established in 1959 by bequest of Alma Hand Britten, in amounts to be specified from time to time by the Trustees, are available to needy full-time graduate or undergraduate students registered in the School of Engineering, who would not otherwise be able to pursue such professional study.

Emma K. Carr Scholarships.—Four scholarships in the amount of \$400 each and ten of \$100 each, established in 1932 by Mrs. Emma K. Carr, are available to "young men (of the white race) for undergraduate or postgraduate work, considering character, capacity, and need".

Henry Harding Carter Scholarship.—This scholarship, in the amount of \$500, established in 1896 by Mrs. Maria M. Carter in memory of her husband, Henry Harding Carter, is available to a deserving student who is preparing for the civil engineering profession.

Maria M. Carter Scholarship.—This scholarship, in the amount of \$50, established in 1871 by Mrs. Maria M. Carter, is available to a young man.

School of Engineering Scholarships.—Four scholarships are available

each year in the School of Engineering to graduates of accredited secondary schools. The holders of these scholarships must carry a full program in the School of Engineering.

Each scholarship is a full-tuition scholarship but does not cover special fees. Each scholarship is for four academic years (summer work is not to be included), provided the holder thereof meets all academic and other standards of the University.

To retain a School of Engineering scholarship, an average of B and C satisfactory standard of deportment must be maintained. In case a student marries after the award is made, the scholarship is forfeited. If, for any reason a holder of a School of Engineering scholarship resigns or is dropped from said scholarship, the scholarship remains unfilled.

Henry Parsons Erwin Scholarship.—This scholarship, in the amount of \$300, established in 1955 by Mrs. Helen B. Erwin as a memorial to her husband, Henry Parsons Erwin, a former Trustee of the University, is available for a student in Engineering.

General Motors College Scholarship.—This scholarship, established in 1955 by General Motors Corporation, is available for an incoming freshman student who is a citizen of the United States and demonstrates outstanding talent, high personal qualifications, and financial need. The amount of the award has been made flexible and will range from an honorary award of \$200, up to an award of \$2,000 per year, depending upon the demonstrated need of the individual. It is renewable for the four years of undergraduate work, provided the student continues to meet the high standards established for the holder of this award.

Hazelton Scholarship.—This scholarship, in the amount of \$275, established in 1950 by the bequest of Lillie S. Hazelton, is awarded annually "for the use and assistance of needy and worthy students".

Eugene and Agnes E. Meyer Scholarships.—A scholarship fund, in the amount of \$3,500, established in 1952 by the Eugene and Agnes E. Meyer Foundation, is available annually "to assist promising students or applicants in meeting the costs of furthering their education, with preferential consideration to children of persons who are employed in public service, including service in the armed forces or the judiciary."

Texaco Scholarship.—This scholarship, established in 1956 by the Texas Company, covers tuition, fees, and textbooks, and is awarded annually to a young man entering the freshman class in a curriculum which will prepare him for a career in the petroleum industry. It is renewable for the four years of undergraduate work provided the student maintains high standards of scholarship and deportment.

The Zonta Club of Washington, D. C., Scholarship.—This Scholarship, in the amount of \$300, offered by the Zonta Club of Washington, D. C.,

is available to a woman who is a junior, senior, or graduate student with special interest in a professional or business career.

THE COLUMBIAN WOMEN SCHOLARSHIP FUNDS

The Columbian Women Scholarships are awarded by the Scholarship Committee of the Columbian Women. Applications for these scholarships should be addressed to the Chairman of the Scholarship Committee, the Columbian Women, The George Washington University, Washington 6, D. C., not later than May 15 preceding the academic year for which the scholarship is to be awarded, or, in the case of award for the spring semester, not later than January 1.

PRIZES

Alpha Chi Sigma Prizes.—Alpha Pi Chapter of Alpha Chi Sigma Fraternity offers annually the following prizes:

A *Handbook on Chemistry and Physics* is awarded to each of the three students who carry at least eighteen semester hours during the freshman year and attain the highest averages in freshman chemistry.

The name and year of graduation of the student who has attained the highest quality-point index in courses in chemistry will be inscribed on a bronze plaque. The winner must have had at least sixteen hours of chemistry including the final semester at The George Washington University.

Martin Mahler Prize in Materials Testing.—This prize established in 1953 by Martin Mahler consists of a one-year membership in the American Society for Testing Materials and is awarded to the upper division or graduate student in engineering who submits the best reports on tests in the Materials Laboratories course with preference given to prestressed concrete tests.

Omicron Delta Kappa Prize.—Alpha Delta Circle of Omicron Delta Kappa Fraternity offers annually a plaque to be awarded to "that member of the senior class who throughout his course has done the most constructive work in the furtherance and upbuilding of the University student activities".

Ruggles Prize.—The Ruggles Prize of \$35, established by Professor William Ruggles in 1859, is awarded annually to a candidate for a baccalaureate degree for excellence in mathematics.

Sigma Kappa Prize.—Zeta Chapter of Sigma Kappa Sorority offers an annual prize of \$10 to the student with the highest grade in the final examination in General Chemistry.

Sigma Tau Prize.—Xi Chapter of Sigma Tau Fraternity offers annually a medal to be awarded to that member of the freshman class in the School of Engineering who maintains the highest scholastic standing in the work of the entire year.

James MacBride Sterrett, Jr., Prize.—This prize, established in 1911 by Professor James MacBride Sterrett in memory of his son, consists of the *American Institute of Physics Handbook* awarded annually to that student who obtains the highest average in Physics 14, 15, and 16.

Theta Tau Activities Plaque.—Gamma Beta Chapter of Theta Tau Fraternity offers annually a plaque to be awarded to that member of the senior class who has the most outstanding record in activities in the School of Engineering during the entire period of his attendance.

Alexander Wilbourne Weddell Prize.—This prize of \$350, established in 1923 by Mrs. Virginia Chase Weddell, is awarded annually to a candidate for a degree who writes the best essay on the subject of "the promotion of peace among the nations of the world". The prize essays shall become the property of the University and shall not be printed or published without the written consent of the University. The University reserves the right to withhold the award if no essay attaining the required degree of excellence is submitted.

FINANCIAL AID

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of The George Washington University have made available a fund for short-term loans to students.

National Defense Student Loan Fund.—This fund is available to full time undergraduate and graduate students who are in need of financial assistance. Priority is given those applicants who express a desire to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than August first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

For information concerning full- and part-time employment, see "The Placement Office", page 24.

REGULATIONS

A student enrolled in the School of Engineering is required to conform to the University regulations and to comply with the rules and regulations of the School of Engineering.

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his

work only under the rules and regulations in force at the time of his return.

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration in any unit of the University.

ATTENDANCE

A student may not attend classes until registration has been completed and fees due have been paid. A student may be dropped from any course for undue absence.

A student suspended for any reason may not attend classes during the period of suspension.

The student is expected to attend every meeting of the course in which he is registered, fully prepared to carry on the work required. The student is held responsible for all work in the course, and all absences must be excused before provision will be made for him to make up the work missed. Excuses for absences from examinations which have been announced in advance can be obtained only by making written application to the instructor in charge of the course.

AMOUNT OF WORK

A full-time undergraduate student who is not on probation may take not more than twenty semester hours. A student employed more than twenty-four hours a week, who is not on probation, may take not more than ten semester hours.

A student previously unemployed who accepts employment subsequent to registration or at any time during a semester is required to report that fact immediately to the Dean, in order that adjustments in schedule may be made, if necessary, to bring his program within the Faculty's limitations upon the amount of work to be carried by an employed student.

ADVISORY SYSTEM

Every student entering the School of Engineering as an undergraduate degree candidate is assigned a permanent Faculty adviser—for the purpose of guiding the educational career of the student, providing assistance in his professional development as an engineer, establishing close relations between the Faculty and the student, and furnishing counsel and advice in all phases of the academic career of the student.

Faculty advisers counsel students on their programs of study, the achievement and maintenance of satisfactory scholastic performance, pro-

fessional development, extracurricular activity as part of the educational process; and assist the entering student to orient himself within the engineering discipline. The adviser represents the student in all cases requiring Faculty action.

Students who have not completed 70 semester hours satisfactorily are required to obtain their advisers' approval of programs of study prior to registration.

A student who has not completed the course work specified for the freshman and sophomore years is required to consult his adviser when so directed by the Dean, and to follow the recommendations of his adviser in all academic matters. However, advisers may not deny a student entry into any course or activity to which he is entitled under the regulations of the School of Engineering. Students having junior or senior status are encouraged to consult their advisers. The Dean acts as temporary adviser to entering or transfer students pending assignment of their permanent advisers.

All students are encouraged to discuss college problems with their advisers or instructors at any time; and parents or guardians are invited to consult with the Dean and advisers, concerning any student problems.

Faculty advisers discharge their counseling duties in accordance with the high principles of their professional responsibility; however, the final responsibility for a student's action lies wholly with the student.

SCHOLARSHIP REQUIREMENTS

A student must maintain a quality-point index of at least 2.00 to be in good academic standing.

A student who fails to maintain the scholarship requirements of the School of Engineering may be dismissed from the University.

GRADES

Grades are not given out by instructors but are mailed to the student through the Office of the Registrar at the close of each semester. Upon request, a copy of the student's grades will be forwarded to his parent or guardian.

The following undergraduate grading system is used: excellent, *A*; good, *B*; average, *C*; passing, *D*; failing, *F*. Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given to the instructor for the student's failure to complete the required work of the course. An "incomplete" can not be made up after the lapse of one calendar year except by permission of the Faculty. Courses from which a student has withdrawn by proper author-

ization will be indicated by the symbol *W*. No student may repeat for grade a course in which he has received a grade of *D* or above, unless required to do so by the department concerned.

For graduate work, grades are indicated as "excellent", "satisfactory", "unsatisfactory". The grade "satisfactory" signifies a high level of scholastic achievement.

QUALITY-POINT INDEX

Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered.

Scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on the complete collegiate record. Courses marked *W* or *I* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded, or at the close of a calendar year, whichever occurs first. If an "incomplete" is not superseded by a proper grade within the allotted time, it is computed as zero quality points.

Grades in courses taken at another institution or taken to satisfy entrance requirements are not considered in computing the quality-point index. Passing grades are essential in required physical education courses, but the grades so earned are not included in the quality-point index.

SCHOLARSHIP *

Undergraduate

In order to graduate, a student must have a quality-point index of at least 2.00 in all work taken at The George Washington University and accepted in the School of Engineering.

Mid-semester Warning.—At the end of the seventh week of each semester, instructors report to the Dean the names of those students whose scholarship is tentatively deemed unsatisfactory. A warning notice is sent to the student and a copy to his adviser. A student who receives warning notices is required to consult his instructor and his adviser immediately.

The adviser may prescribe diagnostic tests and/or remedial study to be completed before the end of the current semester.

Probation.—A student whose quality-point index falls below 2.00 will be placed on probation. This probation will extend over the period in which the student attempts twelve semester hours of study. In certain circumstances the period of probation may be extended.

* For graduate scholarship requirements, see page 56.

A student on probation is required to follow a program of study, including remedial studies if necessary, prescribed by the Committee on Scholarship. A student on probation may not hold office or participate in the activities of any student organization or represent the School in any student activity.

Suspension.—A student whose quality-point index is below 2.00 at the end of his probationary period will be suspended. A student whose quality-point index falls below 2.00, after he has once been removed from probation, will be suspended.

At the time of his suspension a student may apply to the Committee on Scholarship for guidance concerning remedial action he should take during the period of his suspension.

A student suspended for poor scholarship may apply* to be readmitted in the semester or summer session which begins next after an interval of one calendar year. To be considered for readmission he will be required to pass tests or examinations prescribed by the Committee on Admission and Advanced Standing. No advanced standing will be assigned for any course work taken during the period of suspension. A student readmitted after suspension will be on probation. He will be required to maintain a current quality-point index of at least 2.50 on each 12 semester hours of work undertaken until his cumulative quality-point index is 2.00. In no case will the probationary period after readmission exceed 24 semester hours of study. A student suspended twice for poor scholarship will not be readmitted.

ACADEMIC DISHONESTY

Evidence of dishonesty on the part of any student will result in his suspension from the University upon the recommendation of the Dean's Council.

A student found guilty of dishonesty will be deprived of credit for all courses in the semester during which the dishonest act occurs.

A student may apply to be readmitted to the University in the semester or summer session which begins next after an interval of one year from the date of suspension.

CHANGES IN PROGRAM OF STUDIES

A student may not change or drop courses or change his status to that of auditor except with the approval of the Dean of the School upon presentation of adequate reasons for such changes.

Change from one section to another of the same course or from one major subject to another within the School may be made with the ap-

* Application for readmission should be made two months in advance to permit the taking and grading of readmission tests.

proval of the Dean. All requirements specified in the course of study to which the change is made must be satisfied.

Transfer from one college, school, or division to another may be made only with the approval of the deans concerned. Application for such change should be made on the proper form, obtainable in the Office of the Director of Admissions, where it should be filed.

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the Dean. Permission to withdraw from the University will not be granted a student who has not a clear financial record.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance. (For regulations concerning the refund of fees on withdrawal from courses or from the University, see page 36.)

During the seven days following the first day of classes of a semester, additional courses may be added to the student's program with the approval of the instructor, the student's adviser, and the Dean.

No change in program may be made, without academic penalty, after the fourteenth day following the first day of classes of a semester, except in exceptional cases when the Dean, upon recommendation of the Committee on Scholarship, may approve withdrawal from *all courses*. Written request for such withdrawal, stating satisfactory reasons, should be addressed to the Dean.

Unauthorized withdrawal from a course at any time entails a penalty of failure in the course and financial responsibility for the full fee for the course.

HONORS LIST

The Faculty of the School of Engineering recognizes meritorious scholastic achievement by an Honors List, containing in alphabetical order the names of candidates for undergraduate degrees in engineering, whose scholastic achievement satisfies all of the following requirements:

1. The candidate's cumulative quality-point index is equal to or exceeds 3.00.
2. At least thirty semester hours of credit have been earned while a degree candidate in the School of Engineering.
3. At least fifteen (part-time student) or thirty (full-time student) semester hours of credit in an engineering degree curriculum have been earned in the two semesters immediately preceding the award.
4. No grade below *C* has been received during the qualifying period stated above.
5. No disciplinary action has been taken in respect to the student.

The Honors List is prepared at the end of the fall and spring semesters and displayed in an appropriate public place in the School of Engineering. A notation is made on the student's record each time his name is included in an Honors List.

CREDIT

Credit toward a degree is given only after regular registration for and satisfactory completion of the required work of classes in the University, or upon the granting of advanced standing in accordance with the regulations of the School. A student who takes a course as an auditor may not take the same course later for credit.

On request the Registrar will issue to the student a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

TRANSCRIPTS OF RECORD

Official transcripts of student records will be forwarded on request to other institutions. Unofficial copies of records will be issued to the student on request. No charge is made for the first transcript; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a student who does not have a clear financial record.

SUMMER SCHOOL CREDIT

A student who plans to attend summer school sessions at another institution with the intention of having credits so obtained apply toward graduation from this University must first secure the written approval of the Dean. In no event will such credits be recognized to an amount in excess of that which might be earned in a similar period in this institution.

PHYSICAL EDUCATION REQUIREMENTS

Freshmen and sophomores in the School of Engineering are required to take Physical Education 1-2 and 11-12 unless (1) they are registered for less than 10 semester hours, or (2) regular employment during the day makes it necessary to attend classes during the evening hours, or (3) they are enrolled in the Air Force ROTC, or (4) they are veterans.

Any other exemptions will be granted only upon written petition which has been recommended by the physical education department concerned and approved by the Dean of the School.

A student entering the University with advanced standing is not exempt from the physical education requirements unless he has satisfactorily met the requirements elsewhere. Courses in military training are not accepted

in satisfaction of these requirements unless the full two-year basic course has been completed.

The required medical and physical examinations, as specified by the departments of physical education, will be arranged at the time of registration.

USE OF CORRECT ENGLISH

Any student whose written or spoken English in any course whatever is deemed unsatisfactory may be reported by the instructor to the Dean's Council. The Council may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up any such deficiency in English to the satisfaction of the Dean's Council.

GRADUATION REQUIREMENTS

To be recommended by the Faculty for graduation a student must have met the admission requirement of the School, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—Application for a degree must be filed in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Curriculum.—Curriculum requirements for the Bachelor's degrees are stated on pages 51-54; for the Master's degrees, on pages 57-59.

Graduate Record Examination.—All candidates for Bachelor's degrees are required to take two parts of the Graduate Record Examination in the University's institutional testing program. The examinations are conducted by the University twice a year: the Fall Testing Session (December 10, 1960), for seniors graduating in February, and the Spring Session (April 8, 1961) for those graduating in June or October. Dates of the examinations are announced in the *Schedule of Classes*.

Each senior required to take the Graduate Record Examination must register for it in the Office of the Dean when he registers for his final regular semester of study (excluding summer sessions). A \$7 examination fee is payable at the time of registration.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. By special permission seniors who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

Residence.—For the Bachelor's degrees, a minimum of one year or 36 semester hours must be completed in residence. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior or final year must be completed in residence.

The graduate student must meet the residence requirements for the particular degree for which he is registered.

With the permission of the Dean, a student may be granted leave of absence; such student should, however, remain technically in residence by paying the residence fee for each semester he is absent. Failure to maintain registration disrupts his residence status and he may re-enter and continue his work only under the rules and regulations in force at the time of his return.

If a candidate for the degree of Doctor of Science fails to maintain his residence during a period of absence he must reapply for admission to study under whatever new conditions and regulations are set up by his consultative committee. For the purpose of this regulation, the summer session will be disregarded.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for a Master's or Doctor's degree, respectively, must be presented in its final form to the Dean (for the Master's degree), to the Chairman of the Committee on Graduate Studies (for the Doctor's degree), no later than the date specified in the calendar. Three complete copies are required. It is the responsibility of the candidate for a graduate degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the thesis or dissertation, which are rigidly enforced.

Accepted theses and dissertations with accompanying drawings become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in a thesis or dissertation must be secured from the Dean.

Presence at Graduation.—A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the Dean.

HONORS

With distinction.—A Bachelor's degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be

eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—A Bachelor's degree may be conferred with "Special honors", at the discretion of the Faculty, for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.
2. The student must meet such other conditions as may be set at the time his candidacy is approved.
3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.
4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

Military honors.—An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Cadet" if he (1) has completed Air Science 101 and 102 with an academic standing among the upper third of the students enrolled therein; (2) has an accumulative academic average B or better; (3) possesses high moral character and definite aptitude for service in the Air Force; (4) has distinguished himself by demonstrated leadership through participation in recognized extracurricular activities and while in attendance at an Air Force ROTC Summer Training Unit. A "Distinguished Air Force ROTC Cadet" is authorized to wear a "Distinguished Cadet" badge above the right breast pocket of the uniform. He may submit an application for a regular commission in the United States Air Force, which is given final consideration upon his designation as a "Distinguished Air Force ROTC Graduate".

An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Graduate" if he has (1) been designated a "Distinguished Air Force ROTC Cadet" and maintained the standards required of a "Distinguished Air Force ROTC Cadet" during the period between designation and graduation; (2) completed the Air Force ROTC Advanced Course; and (3) completed the requirements for the Bachelor's degree. A "Distinguished Air Force ROTC Graduate" will be presented with a certificate signed by the Commandant, Air Force ROTC, and, if he made application, will be considered for a regular commission in the United States Air Force.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card, issued upon the payment of fees, must be presented as identification. The loan period for most books available for home circulation is two

weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

HOURS

The University Library is open from 9:00 A.M. to 10:00 P.M. each class day (Saturday 9:00 A.M. to 5:00 P.M.), and from 2:00 to 6:00 P.M. on Sunday.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

THE BACHELOR'S DEGREES

The Bachelor's degrees are Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering.

The degree of Bachelor of Science in Engineering may be earned with any of the following options: Chemistry, Engineering Administration, Machine Computer, Mathematics, or Physics.

Curricula leading to the degrees of Bachelor of Civil Engineering, Bachelor of Mechanical Engineering, and Bachelor of Electrical Engineering are accredited by the Engineers' Council for Professional Development, the recognized accrediting body of the engineering profession.

CURRICULUM REQUIREMENTS

The satisfactory completion of one of the following curricula is required.

Physical Education is required of all students in the freshman and sophomore years (See "Physical Education Requirements", pages 46-47.)

Variations from the prescribed curricula may be made, with the permission of the Dean's Council. A student desiring to omit a required course and substitute another must make written application to the Dean presenting satisfactory reasons for the substitution; written approval must be obtained and the required fee paid before registration for the course.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status, see page 34.

FRESHMAN YEAR (FOR ALL ENGINEERING CURRICULA)* Semester Hours

Chem. 11-12	General Chemistry	8
†Eng. 1	English Composition	3
Math. 12	Analytic Geometry	3
Math. 29, 30, 31	Calculus I, II, III.....	9
ME 9	Introduction to Engineering.....	3
ME 10	Graphical Communication	2
Phys. Ed.	See pages 46-47 for statement of requirement.	
Phys. 11	Introductory Physics	3
Phys. 14	General Physics	3
	Total.....	34

ROTC.—Air Force ROTC students substitute Air Science 1-2 and 21-22 (6) for Physical Education 1-2 (2), and may postpone English 1 until the sophomore year.

SOPHOMORE YEAR (FOR ALL ENGINEERING CURRICULA) Semester Hours

CE 21	Rigid Body Mechanics I.....	3
CE 24	Strength of Materials.....	3
EE 11	Electric Circuits	3
EE 12	Electric Machinery	3
Eng. 2	English Composition	3
Math. 111, 112	Mathematics for Engineers and Physicists I, II.....	6
Phys. Ed.	See pages 46-47 for statement of requirement.	
Phys. 15, 16	General Physics	6

* Exceptional students may qualify for admission to advanced courses by successfully completing qualifying examinations.

† Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both semesters of the English Composition course; those who are inadequately prepared for English 1 will be assigned to English A, without credit.

•Elective	In humanities or social studies.....	3
Elective	In humanities or social studies (see pages 78-79)...	6
	Total.....	36

ROTC.—Air Force ROTC students substitute Air Science 11-12 and 51-52 (6) for physical Education 11-12 (2) and Elective (3).

BACHELOR OF CIVIL ENGINEERING

JUNIOR YEAR

		Semester Hours
CE 112	Surveying	3
CE 121	Rigid Body Mechanics II.....	3
CE 125	Engineering Materials	3
CE 132	Fluid Mechanics	8
CE 143-44	Structural Theory I-II.....	3
EE 102	Engineering Electronics	3
ME 113	Thermodynamics I	3
ME 118	Heat Transfer	4
Elective	In humanities or social studies (see pages 78-79)...	4
	Total.....	34

ROTC.—Air Force ROTC students substitute Air Science 101 and 102 (6) for Elective (4).

SENIOR YEAR

		Semester Hours
CE 128	Soil Mechanics	3
CE 135	Hydraulic Engineering	3
CE 137	Applied Earth Sciences.....	3
CE 145	Metal Structures	3
CE 146	Reinforced Concrete	3
CE 154	Structural Dynamics	3
CE 157	Mechanics of Deformable Bodies.....	3
CE 165	Engineering Planning and Organization.....	6
CE 168	Regional and Urban Planning.....	3
Elective	In humanities or social studies (see pages 78-79)...	3
Elective	Technical Elective	36
	Total.....	36

ROTC.—Air Force ROTC students substitute Air Science 151-52 (6) for Technical Elective (3).

BACHELOR OF ELECTRICAL ENGINEERING

JUNIOR YEAR

		Semester Hours
CE 121	Rigid Body Mechanics II.....	3
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics	3
EE 103	Electric and Magnetic Fields.....	3

* B.E.E. candidates may elect Speech 1, English 11, or Psychology 1.

EE 104	Field Analysis	3
EE 107	Steady-state Network Analysis	3
EE 111, 112	Electrical Measurements	4
EE 113	Electric Power Laboratory	2
EE 122	Measurements and Electronics Laboratory.....	2
Phys. 116	Quantum and Solid State Physics.....	3
Elective	In humanities or social studies (see pages 78-79)...	5
Total.....		34

ROTC.—Air Force ROTC students substitute Air Science 101 and 102 (6) for Elective (3).

SENIOR YEAR		Semester Hours
EE 114	Electric Power Laboratory.....	2
EE 118	Electrical Energy Conversion.....	3
EE 123	Electronic Devices and Systems Laboratory.....	2
EE 124	High-frequency Communications Laboratory.....	2
EE 127	General Network Analysis.....	3
EE 133	Engineering Analysis	3
EE 136	Electromagnetic Waves	3
EE 137	Electronic Circuits and Systems.....	3
EE 171	Digital Circuitry and Systems.....	3
EE 189-90	Proseminar in Electrical Engineering.....	2
ES 154	Automatic Control	4
ME 113	Thermodynamics I	3
Elective	In humanities or social studies (see pages 78-79)...	3
Total.....		36

ROTC.—Air Force ROTC students substitute Air Science 151-52 (6) for Elective (3).

BACHELOR OF MECHANICAL ENGINEERING

JUNIOR YEAR		Semester Hours
CE 121	Rigid Body Mechanics II.....	3
CE 125	Engineering Materials	4
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics	3
ME 100	Analytical Kinematics	3
ME 113, 114	Thermodynamics I, II	6
ME 118	Heat Transfer	3
ME 120	Physical Metallurgy	3
Phys. 116	Quantum and Solid State Physics.....	3
Phys. 191	Nuclear Reactors	3
Elective	In humanities or social studies (see pages 78-79)...	2
Total.....		36

ROTC.—Air Force ROTC students substitute Air Science 101 and 102 (6) for Elective (2).

SENIOR YEAR		Semester Hours
CE 157	Mechanics of Deformable Bodies.....	3
ME 123, 124	Advanced Dynamics I, II.....	6
ME 135-36	Thermal Power	6
ME 139	Fluid Machinery	3
ME 143	Production Analysis	3
ME 146	Dynamics of Compressible Fluids.....	3
ES 154	Automatic Control	4
Elective	In humanities or social studies (see pages 78-79)...	6
Total.....		34

ROTC.—Air Force ROTC students substitute Air Science 151-52 (6) for Elective (3)

BACHELOR OF SCIENCE IN ENGINEERING

JUNIOR AND SENIOR YEARS		Semester Hours
CE 121	Rigid Body Mechanics II.....	3
CE 125	Engineering Materials.....	4
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics	3
EE 103	Electric and Magnetic Fields.....	3
ME 100	Analytical Kinematics	3
ME 113	Thermodynamics I	3
ME 118	Heat Transfer	3
ME 120	Physical Metallurgy	3
Phys. 116	Quantum and Solid State Physics.....	3
Total of required courses.....		31
Option	As approved by the Department of Option and by the Dean	30
Elective	In humanities or social studies (see pages 78-79)...	9
Total.....		70

ROTC.—Air Force ROTC students substitute Air Science 101, 102, 151-52 (12) for Elective (3) and Option course (3).

The Bachelor of Science in Engineering curriculum provides training in the basic physical principles employed in engineering and in engineering methods of analysis, and in addition, offers an opportunity for study in an optional field in which the student has special interest.

Optional studies can be selected from one or (occasionally) more of the fields of Chemistry, Engineering Administration, Machine Computer, Mathematics, or Physics. The program of study in the option is formulated by the department concerned in conference with the student. The program, bearing the approval of the Executive Officer of the department concerned, must be submitted by the student to the Dean before the beginning of the junior year.

THE MASTER'S DEGREES

Upon satisfactory completion of appropriate graduate requirements, the degree of Master of Science in Engineering or Master of Engineering Administration is conferred.

Study for the Master's degree is based upon a faculty-student relationship in which the ability and needs of the individual student are important elements in determining the curriculum. Programs are not restricted to one department or to a single field or type of study. They may include special instruction by assigned members of the engineering faculty or approved courses offered in other colleges and schools of the University. The Committee on Graduate Studies has the responsibility for establishing each student's program and for providing for its direction.

ADMISSION TO GRADUATE STUDY

For admission to graduate study the student must hold a Bachelor's degree from a recognized institution; satisfy the Committee on Graduate Studies of his capacity for productive work in the discipline; and give evidence of preparation which, in the opinion of the Committee, is adequate for graduate study in the field selected.

Applicants who have significant deficiencies in their preparation for graduate study may undertake prescribed undergraduate programs to qualify for admission as graduate students in the School of Engineering.

In some cases such undergraduate study may be carried on in addition to a limited graduate program. In no case may the undergraduate courses fulfill any part of the requirements for the graduate degree.

ADMISSION TO DEGREE CANDIDACY

Application for admission to candidacy for a Master's degree must be made in writing to the Committee on Graduate Studies. To be accepted the applicant must have (1) been accepted for graduate study, (2) satisfactorily completed 9 semester hours of graduate courses, and (3) give evidence of satisfactory personal and intellectual qualifications. In exceptional cases the requirement of 9 semester hours of graduate courses may be reduced.

ADVANCED STANDING

Graduate courses completed before admission to graduate study are not transferable for degree credit. The Committee on Graduate Studies has the discretion, however, to consider them in establishing individual programs. Course work to satisfy degree requirements in another school or college of the University may not be so applied in the School of Engineering.

REQUIREMENTS FOR THE DEGREES

Residence

The candidate for a Master's degree must complete a minimum of one year of full-time study, or the equivalent in part-time study, under the direction of the Committee on Graduate Studies. A full-time student must complete all requirements for the degree within three years; a part-time student, within five years.

Scholarship

A minimum grade of "Satisfactory" is required in all courses. A student who makes one grade of "Unsatisfactory" may repeat the course once, or he may appeal to the Committee on Graduate Studies for guidance. A student who receives two or more grades of "Unsatisfactory" will not be permitted to enroll further in the School of Engineering until he demonstrates by examination, or as the Committee may direct, that his deficiencies in course work have been removed. A grade of *B* or better is required for undergraduate courses taken to remove deficiencies in preparation for graduate study.

Master's Thesis

The degree candidate must submit an acceptable thesis to demonstrate his ability to make independent use of the knowledge and discipline of thought acquired and developed by graduate study, and to furnish objective evidence of constructive power in a given field. Work of a suitable character for which the student has professional responsibility may be considered, whether done on or off campus, provided no significant amount of work is completed without faculty supervision.

Comprehensive Examination

To demonstrate substantial understanding of principles and methods of their use in the area of his interest, the student must pass a comprehensive examination, written, oral, or both, as prescribed by the Committee on Graduate Studies. This examination will not be taken until the candidate has successfully completed the prescribed program of study and submitted an acceptable Master's thesis.

THE DEGREE OF MASTER OF SCIENCE IN ENGINEERING

The objective of this discipline is a substantial comprehension of scientific principles and methods for their use, as applied in modern engineering. Increased understanding of engineering science and its use in solving engineering problems are sought, rather than a breadth of familiarity with applications and techniques.

A program of study consisting of at least 24 semester hours of graduate courses to prepare the candidate for his comprehensive examination is formulated from the following areas with particular attention to the individual student's needs and objectives. The program may provide for broad coverage in a variety of fields or may be designed to give some degree of specialization in a particular area, as determined by conference with the Committee at the time of admission to candidacy.

The level of the courses ordinarily requires as prerequisite the satisfactory completion of at least one undergraduate course in mathematics beyond the first course in ordinary differential equations and at least one in the area of the graduate course to be undertaken.

REQUIRED COURSES

Upon admission to graduate study, the following courses must be taken prior to application for admission to candidacy for the degree:

ES 211 Analysis of Engineering Systems I (3)

ES 217 Analytical Mechanics (3)

In addition a choice must be made of one or two courses in the areas marked by an asterisk in the Fundamental Engineering group below.

PROGRAM OF STUDY

After admission to candidacy for the degree, the balance of the program may be arranged in consultation with the Committee on Graduate Studies from the following:

Basic

Mathematics.—Theory of functions of a complex variable, mathematical statistics, mathematical probability, vectors, tensors, matrices.

Physics.—Classical field theory, quantum mechanics, solid state physics, nuclear physics.

Applied Mathematics.—Numerical and graphical analysis, advanced mathematics for engineers.

Fundamental Engineering

*Automatic Control
*Elasticity
Elastic Stability
*Electric Networks
*Electromagnetic Fields
Electronics
*Fluid Dynamics
Gas Dynamics

Heat Transfer
Modulation and Noise
Nonlinear Mechanics
Plates and Shells
Plasticity
*Structural Theory
*Thermodynamics
*Transients

Elective

This group consists of courses offered occasionally in such areas as digital computers, high-speed aerodynamics, jet propulsion, potential theory, structural analysis, and transistors. In addition, graduate courses in areas not included in the Basic group offered by the departments of Mathematics, Statistics, Physics, and Chemistry may be taken for degree credit with the approval of the Committee. In general, work in areas which are characterized by a scientific discipline may be accepted in satisfaction of course requirements for the degree of Master of Science in Engineering.

THE DEGREE OF MASTER OF ENGINEERING ADMINISTRATION

The objective of this discipline is to develop an understanding of the principles and a competence in the practices of administration as applied to engineering and scientific activities. Knowledge and understanding are sought rather than mere familiarity with techniques.

A study program is prescribed for each candidate, in accordance with his preparation and objective, by the Committee on Graduate Studies or an assigned adviser. Programs are integrated sequences of courses.

The degree of Master of Engineering Administration is granted upon the successful completion of (1) 30 semester hours of graduate courses, including the written Master's thesis, and (2) the Comprehensive Examination.

PREREQUISITE TO ADMISSION TO GRADUATE STUDY

In addition to the requirements for admission to graduate study stated on page 55, the applicant must have an adequate knowledge of the principles of human relations, the fundamentals of accounting, and the fundamentals of statistics. This requirement can be met by the successful completion of the following undergraduate courses or an approved equivalent: Psychology 145 *Principles of Human Relations*, Accounting 115 *Survey of Accounting*, or Statistics 107 *Statistics for Engineers*.

PROGRAM OF STUDY

The content of the courses immediately following is considered essential knowledge for every candidate for the degree of Master of Engineering Administration. The candidate is required to complete all of the courses except those in which he (1) has successfully completed graduate study or (2) can demonstrate to the Committee on Graduate Studies an acceptable knowledge of the course field. The following Engineering Administration courses must be taken prior to admission to candidacy: 201 *Engineering Administration I*, 202 *Engineering Administration II*, and 271 *Operations Research*.

	Semester Hours
EA 201	
EA 202	
EA 271	
EA 299-300	
Engineering Administration I.....	3
Engineering Administration II.....	3
Operations Research	3
Master's Thesis	6

The following courses provide knowledge in certain special areas of significance in engineering administration. The candidate is required to select at least two; it is preferable that he elect three.

	Semester Hours
EA 206	
EA 251	
EA 252	
Stat. 262	
Human Relations in Administration.....	3
Management of Research and Development.....	3
Production and Maintenance Management.....	3
Managerial Statistics and Quality Control.....	3

Elective

Courses are to be elected to provide a total of 30 semester hours for the program.

	Semester Hours
EA 261	
EA 263	
EA 272	
EA 273-74	
EA 295	
EA 296	
Acct. 215	
Acct. 293	
Bus. Adm. 250	
Pub. Adm. 213	
Stat. 271-72	
Elective	
Economic Analysis in Engineering Planning.....	3
Quantitative Techniques of Engineering Administration	3
Problems in Operations Research.....	3
Techniques of Operations Research.....	6
Applied Research in Engineering Administration (arr.)	
Research in Engineering Administration (arr.)	
Survey of Managerial Accounting.....	3
Budget Preparation and Control.....	3
Contract Administration	3
Administration in Government.....	3
Statistical Information Theory.....	6
(To be selected from Engineering or the sciences), as approved by the Committee on Graduate Studies..	3-6

THE DOCTORAL PROGRAM

INTRODUCTORY

The School of Engineering offers a program of advanced study and research leading to the degree of Doctor of Science. This program is limited to recognized engineering fields in which a scientific discipline exists and for which the University has adequate resources.

The Doctoral discipline is designed to prepare the student for a career of creative scholarship by providing a broad background of knowledge and an understanding of research methods. It requires study of interrelated fields of learning as well as original research in the engineering field of central interest.

The discipline for the degree is divided into two stages. The first—made up of a study of interrelated fields of learning which support the general area of research concentration—culminates in the qualifying examination. The second—composed of research investigation of a particular subject in a special field and the presentation of such research findings in a written dissertation—culminates in the final examination.

Detailed information on the program is provided in a separate publication obtainable on request.

ADMISSION

The applicant must possess adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. The applicant must have capabilities and interests beyond the ability to assimilate organized materials in formal courses of instruction. Originality of mind combined with balanced judgment and accuracy in observation or experiment are necessary to the successful applicant.

Language Requirements

A reading knowledge is required of two foreign languages important in the student's field of interest. One language examination must be passed before admission to graduate study. The second must be passed before admission to the qualifying examination and within one year of the start of study for the qualifying examination.

Application for Admission

Well in advance of the opening of the semester for which the student seeks admission, he must have a personal interview with the Chairman of the Committee on Graduate Studies or the professor under whom he wishes to study, to discuss the field of study, the University's facilities for guidance in this field, the applicant's qualifications, and the possibilities for an effective doctoral program. If an application for admission is indicated, the student will be advised concerning the details of application procedure.

STUDY FOR THE QUALIFYING EXAMINATION

Upon admission to study for the qualifying examination the student's admission committee becomes his Consultative Committee, which prescribes and directs his studies. The Committee assigns to him a group of fields of learning deemed necessary to insure his breadth of knowledge, as well as to support research in his central field. Members of the Committee advise the student concerning the scope and content of these fields.

of study, which are generally more inclusive and intensive than courses of instruction announced in the University catalogue, and will guide him in preparation for his examination in them.

The purpose of the qualifying examination is to ascertain that the student's breadth of background and intellectual development are adequate to support doctoral research and investigation in his central field. The qualifying examination is both written and oral and usually extends over a period of six days. It is given by a special committee consisting of members of the student's Consultative Committee and other scholars. Upon favorable report of the examiners to the Committee on Graduate Studies the student is admitted to candidacy for the degree, to pursue his specialized study and research under the supervision of a designated member of the Faculty.

The examination is the sole test of the student's ability to qualify for admission as a candidate for the degree, and to enter the second stage of his doctoral discipline.

RESEARCH, THE DISSERTATION, AND THE FINAL EXAMINATION

The student admitted to candidacy for the degree requests as Master in Research the member of the Faculty under whom he wishes to pursue research and specialized study. The Faculty member may accept or reject such request. The research is arranged by the Master and approved by the Committee on Graduate Studies. Throughout the remainder of the doctoral program, the candidate is responsible solely to his Master in his research and in the presentation of his dissertation.

A dissertation is required as evidence of ability to perform scholarly research and to interpret and present its results. Upon approval of the dissertation (see page 48) by the Master, the candidate is presented for his final examination. The summaries of accepted dissertations are printed in a numbered issue of the University BULLETIN. The successful candidate is required before receiving his degree to pay a fee to cover the expense of the printing of the summary of his dissertation.

The final examination is oral and is open to the public. The candidate must demonstrate a mastery of his special field of interest and of the materials and techniques used in the research. The committee of examiners includes members of the Committee on Graduate Studies competent in the research field or in closely related subjects and may also include qualified experts brought to the University especially to participate in the examination. If the candidate satisfies the examining committee concerning the high quality and originality of his contribution to knowledge as well as his mastery of the scholarship and research techniques of his field, the Committee on Graduate Studies recommends him for the degree of Doctor of Science.

RESIDENCE AND CONTINUOUS STUDY

All of the work for the degree must be done in residence (on the campus), except in certain circumstances when the student may be permitted to undertake a portion of the research problem in an approved off-campus facility. The student must maintain continuous registration in the School of Engineering, even when the Committee on Graduate Studies has granted a leave of absence. Failure to maintain registration in each semester of the academic year disrupts the residence status of the student, and he must reapply for admission to graduate study under whatever new conditions and regulation are set up by his consultative committee.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the qualifying examination or as a candidate engaged in doctoral research. The qualifying examination, however, must be completed within five years of the date of admission, and the entire degree program must be completed within seven years. After admission the student may apply for his qualifying examination whenever his consultative committee believes that he is prepared to take it; his research and specialized study may be undertaken with whatever concentration of time meets the approval of his research adviser. Normally a minimum of two years of full-time study and research is spent in meeting the requirement for the degree.

COURSES OF INSTRUCTION

COURSES OF INSTRUCTION

On the following pages, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered in the School of Engineering. Also listed are courses offered by other schools and colleges of the University, but required or accepted as electives for the degrees in engineering. The courses as here listed are subject to some slight change. Students are referred to the Schedule of Classes, which is available prior to the opening of each semester, for the hourly scheduling of all courses of instruction.

The University reserves the right to withdraw any course announced.

EXPLANATION OF COURSE NUMBERS

The following system of numbering is used to identify courses.

Undergraduate courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. Courses numbered from 101 to 200 are planned for students in the junior and senior years.

Graduate courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the Chairman of the Committee on Graduate Studies and the Dean, to qualified seniors.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving three hours of credit each semester is marked (3-3), and a semester course giving three hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ENGINEERING

UNDERGRADUATE COURSES

CIVIL ENGINEERING

Rigid Body Mechanics I (3)

Fall—morning and evening; spring—evening. Fundamental laws of Newtonian mechanics; equilibrium of a particle and a system of particles; beams, cables, trusses, and friction; plane kinematics. Prerequisite: Mathematics 31, Physics 14.

24 *Strength of Materials* (3)

Fall—evening; spring—morning and evening. Elementary principles of mechanics of deformable bodies; elastic and inelastic behavior, concept of stress and strain in two and three dimensions, strain energy and its application; analysis of axial loading, pure bending, torsion, combined loading, buckling, stress concentration, and fatigue. Prerequisite: Civil Engineering 21, Mathematics 31.

112 *Surveying* (3)

Spring: lecture (2 hours), field work (2 hours)—Saturday. Plane surveying, including measurements, simple curves, and topographical surveying; space measurements; treatment of observational errors; earthwork computations; field astronomy. Prerequisite: Mathematics 31, Mechanical Engineering 10.

121 *Rigid Body Mechanics II* (3)

Fall—morning and evening; spring—evening. General force systems, equilibrium of a rigid body, generalized coordinates and constraints, work and potential energy, kinetic energy and angular momentum, dynamics of a particle and rigid bodies in space, impulsive motion. Prerequisite: Civil Engineering 21, Mathematics 111.

125 *Engineering Materials* (4)

Fall: lecture—morning and evening; laboratory—afternoon and evening. Mechanical and surface properties of engineering solids; relationships between the structure of a material and its mechanical and physical behavior; principles of the control of the properties of metals and nonmetallic solids.

128 *Soil Mechanics* (3)

1960-61 and alternate years: spring—afternoon; 1961-62 and alternate years: spring—evening. Mechanical properties of soils; theory and applications of lateral earth pressure, bearing capacity, and settlement of foundations. Prerequisite: Civil Engineering 125, 137, 144.

132 *Fluid Mechanics* (3)

Spring: lecture—morning and evening; laboratory—afternoon and evening. Development of the fundamental principles of flow of viscous and ideal compressible and incompressible fluids; dimensional analysis and model theory; laboratory work emphasizes principles, analysis of tests, and systematic observations of phenomena. Prerequisite: Civil Engineering 121, Mathematics 111. Mechanical Engineering 113. Laboratory fee, \$11.

135 *Hydraulic Engineering* (3)

1960-61 and alternate years: spring—afternoon; 1961-62 and alternate years: spring—evening. Applied fluid mechanics; pipe and open-channel flow; dams, spillways, and reservoirs; hydroelectric development; drainage and irrigation; control of river flow and floods; water supply and sewerage. Prerequisite: Civil Engineering 137.

137 *Applied Earth Sciences* (3)

1960-61 and alternate years: fall—afternoon; 1961-62 and alternate years: fall—evening. Structural geology of rock and soil formations, seismology, climatology, ground water and river flow, hydrology, erosion and sedimentation, conservation. Prerequisite: Chemistry 12, Civil Engineering 125, 132.

143-44 Structural Theory I-II (4-4)

1960-61 and alternate years: academic year—afternoon; 1961-62 and alternate years—evening. Theory and structural behavior of statically determinate and indeterminate beams, frames, trusses, and arches, and the application of basic principles to their analysis; structural laboratory including structural model analysis. Prerequisite or concurrent registration: Civil Engineering 125. Laboratory fee, \$11 a semester.

145 Metal Structures (3)

1960-61 and alternate years: spring—evening; 1961-62 and alternate years: spring—afternoon. Application of structural theory to the analysis and design of metal structures under static and moving loads. Prerequisite: Civil Engineering 144, 157.

146 Reinforced Concrete (3)

1960-61 and alternate years: fall—evening; 1961-62 and alternate years: fall—afternoon. Theory and design of plain and reinforced concrete structures. Prerequisite: Civil Engineering 144. Prerequisite or concurrent registration: Civil Engineering 157.

154 Structural Dynamics (3)

1960-61 and alternate years: spring—afternoon; 1961-62 and alternate years: spring—late afternoon. Single degree of freedom systems, energy methods of finding natural frequencies, transient and forced vibration of structures. Prerequisite: Civil Engineering 144, Mathematics 111.

157 Mechanics of Deformable Bodies (3)

1960-61 and alternate years: fall—afternoon; 1961-62 and alternate years: fall—late afternoon. An introduction to the advanced mechanics of deformable bodies including the theories of elasticity in cartesian and polar coordinates, plasticity of perfectly plastic solids, plates, and elastic stability. Prerequisite: Civil Engineering 125, Mathematics 112. Prerequisite or concurrent registration: Civil Engineering 144 or Mechanical Engineering 123.

165 Engineering Planning and Organization (3)

1960-61 and alternate years: fall—late afternoon; 1961-62 and alternate years: fall—afternoon. Planning, organization, administration, and economics of engineering programs and projects. Prerequisite: senior standing.

168 Regional and Urban Planning (3)

1960-61 and alternate years: spring—late afternoon; 1961-62 and alternate years: spring—afternoon. Introduction to regional and urban planning with emphasis on requirements for transportation systems. Prerequisite: Civil Engineering 165.

195-96 Problems in Civil Engineering (arr.)

Academic year—as arranged. Special problems approved by the Staff. Prerequisite: senior standing.

ELECTRICAL ENGINEERING

11 *Electric Circuits* (3)

Fall—morning and evening; spring—morning and evening. Current, voltage, power, Kirchhoff's laws, steady-state mesh and node analysis, simple transients, matrices and determinants, network theorems, resonance, balanced polyphase circuits. Prerequisite: Mathematics 30. Prerequisite or concurrent registration: Physics 15.

12 *Electric Machinery* (3)

Fall—morning and evening; spring—morning and evening. Analysis of d-c and a-c rotating machines in steady state, theory of idealized transformers. Emphasis is placed on electromechanical energy conversion. Prerequisite: Electrical Engineering 11.

102 *Engineering Electronics* (3)

Spring—morning and evening. Introductory treatment of physical concepts of electron-tube and semi-conductor devices, their electrical characteristics, and their use in electronic circuit applications. Linear and nonlinear methods of analysis. Prerequisite: Electrical Engineering 11, Mathematics 112.

103 *Electric and Magnetic Fields* (3)

Fall—morning and evening. Introduction to vector analysis; basic concepts of electrostatics and magnetics. Analysis of resistance, capacitance, inductance, forces, magnetic circuits. Prerequisite: Electrical Engineering 11, Mathematics 112.

104 *Field Analysis* (3)

Spring—morning and evening. Solid angle, method of images, vector potential, magnetic scalar potential, conformal mapping, solutions of Laplace's equation, field plotting, analogues. Particle motion in electric and magnetic fields. Introduction to Maxwell's equations. Prerequisite: Electrical Engineering 103, Mathematics 112.

107 *Steady-state Network Analysis* (3)

Fall—morning and evening. Four-terminal networks, network theorems, poles and zeros of network functions, resonance, filters, coupled circuits, transmission lines, Fourier series, matrices. Prerequisite: Electrical Engineering 11, Mathematics 112.

111 *Electrical Measurements* (2)

Fall—morning and evening. Systems of units; theory of errors; d-c indicating instruments and galvanometer dynamics; precision measurement of voltage, current, and resistance. Prerequisite: Electrical Engineering 11, Mathematics 112.

112 *Electrical Measurements* (2)

Spring—morning and evening. Theory of a-c indicating instruments, a-c bridges, waveforms, frequency measurements, measurement of power and energy. Prerequisite: Electrical Engineering 107, 111.

113-14 *Electric Power Laboratory* (2-2)

Academic year—afternoon and evening. Experiments in d-c and a-c circuits, instruments, and machines. Prerequisite to Electrical Engineering 113: Electrical Engineering 12. Prerequisite to Electrical Engineering 114: Electrical Engineering 113. Laboratory fee, \$11 a semester.

118 *Electrical Energy Conversion* (3)

Spring—morning and evening. Analysis of physical systems involving electrical, mechanical, and thermal energy conversion; mathematical formulations using the Euler-Lagrange equation; transient and steady-state analysis of special machines including the generalized rotating energy converter. Prerequisite: Electrical Engineering 12, Mathematics 112. Prerequisite or concurrent registration: Electrical Engineering 104, 112.

122 *Measurements and Electronics Laboratory* (2)

Spring—afternoon and evening. Experiments with sources, meters, bridges, and simple electronic devices; network theorems and resonance; use of instruments and oscilloscope; measurement of resistance, capacitance, inductance. Prerequisite or concurrent registration: Electrical Engineering 102, 112. Laboratory fee, \$11.

123 *Electronic Devices and Systems Laboratory* (2)

Fall—afternoon and evening. Theory and use of electronic devices and instruments. Experiments in active networks, tubes and transistors, nonlinear elements, complex waveform analysis, transfer characteristics. Prerequisite: Electrical Engineering 122. Prerequisite or concurrent registration: Electrical Engineering 137. Laboratory fee, \$11.

124 *High-frequency Communications Laboratory* (2)

Spring—afternoon and evening. Experiments at radio- and microwave-frequencies: impedance, amplifiers, transmitters, lines, waveguides, slotted lines, antennas, horns, power, oscillators. Prerequisite: Electrical Engineering 123. Prerequisite or concurrent registration: Electrical Engineering 136. Laboratory fee, \$11.

125-26 *Project Laboratory* (2-2)

Academic year—as arranged. Creative projects and experiments with electrical and electromechanical devices and systems carried out under individual supervision. May be substituted for required courses. Prerequisite: Electrical Engineering 122, senior status, and permission of instructor. Laboratory fee, \$11 a semester.

127 *General Network Analysis* (3)

Fall—morning and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeros of network functions, correlation of time and frequency domains, one-terminal- and two-terminal-pair networks. Prerequisite: Electrical Engineering 107, Mathematics 112.

133 Engineering Analysis (3)

Fall—morning. Application of fundamental principles of engineering, physics, and mathematics to problems in various fields of engineering. Emphasis is placed on problem solving using concepts previously studied. Prerequisite: Civil Engineering 121; Electrical Engineering 102, 118; Mathematics 112; Physics 16.

136 Electromagnetic Waves (3)

Spring—morning and evening. Electromagnetic waves in bounded media, radiation from antennas, high-frequency transmission lines, cavity resonators and microwave devices. Prerequisite: Electrical Engineering 104, Mathematics 112.

137 Electronic Circuits and Systems (3)

Fall—morning and evening. Analysis of two-port networks; matrix representation of linear active networks; vacuum-tube and semiconductor circuit theory; concepts of feedback, stability, and oscillators. Nonlinear circuit analysis, modulation, detection, communication systems. Prerequisite: Electrical Engineering 102 or Physics 132, Electrical Engineering 107, Mathematics 112.

171 Digital Circuitry and Systems (3)

Fall—late afternoon. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits. Prerequisite: Mathematics 111, Electrical Engineering 102 or Physics 132.

172 Digital Techniques (3)

Spring—late afternoon. Continuation of Electrical Engineering 171. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic-core circuits, memory systems, analog-to-digital techniques, wiring diagrams. Prerequisite: Electrical Engineering 171.

174 Digital and Analog Computer Laboratory (2)

Spring—afternoon. Theory and use of digital and analog computers: programming, operating, logical circuitry, design, troubleshooting. Prerequisite: Electrical Engineering 137, 171. Laboratory fee, \$11.

189-90 Proseminar in Electrical Engineering (1-1)

Academic year—late afternoon. Oral and written presentation of technical and nontechnical papers by students, with group discussion and critical analysis. Prerequisite: senior status.

191 Proseminar in Digital Computers (1)

Fall—late afternoon; spring—late afternoon. Oral and written presentation of technical and nontechnical papers based on current literature and on original studies, with group discussion and critical analysis. Prerequisite: senior status.

MECHANICAL ENGINEERING

9 *Introduction to Engineering** (3)

Fall—morning and evening; spring—evening. Number systems, computation aids, scientific method, problem solving techniques, use of mathematical tables. Emphasis is placed on the development of sound reasoning and study methods.

10 *Graphical Communication* (2)

Fall—evening; spring—morning and evening. Spatial visualization, engineering drawing, schematic diagrams, descriptive geometry. A laboratory course. Laboratory fee, \$10.

100 *Analytical Kinematics* (3)

1960-61 and alternate years: spring—evening; 1961-62 and alternate years: spring—morning. Theoretical study of the motion of constrained and unconstrained rigid bodies. Prerequisite or concurrent registration: Civil Engineering 121, Mathematics 112.

113 *Thermodynamics I* (3)

Fall—morning and evening. Theoretical study of fundamental concepts, equations of state, first and second laws of thermodynamics, entropy, single and two-phase mixtures. Prerequisite: Chemistry 12, Mathematics 31, Physics 16.

114 *Thermodynamics II* (3)

Spring—late afternoon. Theoretical study of vapor cycles, combustion, gas dynamics, equilibrium, multiphase mixtures. Prerequisite: Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132, Mechanical Engineering 118.

118 *Heat Transfer* (3)

Spring—morning and evening. Heat transfer theory, conduction, convection, radiation, field and potential theory applied to conduction. Prerequisite: Mathematics 112, Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132.

120 *Physical Metallurgy* (3)

1960-61 and alternate years: spring—morning; 1961-62 and alternate years: spring—evening. Physics of metals, crystal and lattice structures, binary and ternary alloys, properties of alloys, nonequilibrium conditions, phase diagrams. Lecture and laboratory. Prerequisite: Civil Engineering 125, Mathematics 31. Laboratory fee, \$10.

123 *Advanced Dynamics I* (3)

1960-61 and alternate years: fall—evening; 1961-62 and alternate years: fall—morning. Shock and vibrations in linear mechanical systems, electromechanical analogies, transient and steady-state analysis. Prerequisite: Mechanical Engineering 100. Prerequisite or concurrent registration: Civil Engineering 157.

*This course should be completed before the beginning of the sophomore year.

124 *Advanced Dynamics II* (3)

1960-61 and alternate years: spring—evening; 1961-62 and alternate years: spring—morning. Advanced study of dynamics of continuous mechanical systems. Lagrange's equations, Hamilton's principle, gyroynamics. Prerequisite: Mechanical Engineering 123.

135-36 *Thermal Power* (3-3)

1960-61 and alternate years: academic year—evening; 1961-62 and alternate years: academic year—morning. Analysis and design principles governing systems and components in heat-power, gas and vapor turbines, internal combustion engines, heat pumps, nuclear power systems. Lecture and laboratory. Prerequisite: Civil Engineering 132; Mechanical Engineering 114, 118; Physics 191. Prerequisite or concurrent registration: Mechanical Engineering 139. Laboratory fee, \$15 a semester.

139 *Fluid Machinery* (3)

1960-61 and alternate years: fall—evening; 1961-62 and alternate years: fall—morning. Positive-displacement machines; hydraulic circuits and servo-mechanisms; general theory of dynamic machines; velocity diagrams and work transfer; radial, axial, and mixed-flow machines; torque converters and couplings; jet machines. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 113. Prerequisite or concurrent registration: Mechanical Engineering 123. Laboratory fee, \$10.

143 *Production Analysis* (3)

1960-61 and alternate years: fall—morning; 1961-62 and alternate years: fall—evening. Principles of schematic models, mathematical programming, quality control, operations analysis. Prerequisite: Mathematics 112.

146 *Dynamics of Compressible Fluids* (3)

1960-61 and alternate years: spring—evening; 1961-62 and alternate years: spring—morning. Mathematical theory of compressible fluid flow, flow around immersed bodies, airfoil theory, shock-wave theory, thermodynamics of compressible fluids. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 118. Laboratory fee, \$10.

195-96 *Special Topics in Mechanical Engineering* (arr.)

Academic year—as arranged. Special problems approved by the Staff. May be substituted for required senior courses. Prerequisite: senior status and approval of the instructor.

GRADUATE COURSES

Prerequisites for graduate courses are not listed explicitly. Instructors in individual courses will state prerequisites, and may recommend preparatory work to be completed prior to admission to the course. (See also pages 58-59.)

ENGINEERING ADMINISTRATION

The School of Engineering offers the following courses primarily for candidates for the degree of Master of Engineering Administration. Other courses listed in this program are offered by the departments of Accounting, Business and Public Administration, Psychology, and Statistics.

191 Engineering Law* (3)

Spring—evening. The influence of contract, property, and tort law upon engineering activities. Legal principles relating to the organization and management of engineering companies and governmental departments; legal procedures of interest to engineers. Topics considered include contracts, agency, partnership, corporations, liens, and expert testimony.

201 Engineering Administration I (3)

Fall—evening; spring—evening. Application of scientific method to the administrative processes of (1) planning and (2) organizing; including development of objectives, key factors in planning, basics of organization, stages of organizational growth, special problems of organization in an engineering or scientific enterprise.

202 Engineering Administration II (3)

Fall—evening; spring—evening. Continuation of Engineering Administration 201. Application of scientific method to the administrative processes of (3) managing or directing and (4) evaluation and control. Study of delegation; decentralization; personnel relations; management development; systems engineering; automation; financial analysis, budgeting, and administrative audits.

206 Human Relations in Administration (3)

Fall—evening; spring—evening. The meaning, principles, and practices of management development and personnel relations; collective bargaining; principles and practices of personnel administration; professional social relations.

251 Management of Research and Development (3)

Fall—evening; spring—evening. Management problems involved in the administration of research and development programs; exploration of techniques in programming; selection of organizations for research, maintenance, control, and evaluation of projects.

252 Production and Maintenance Management (3)

Fall—evening; spring—evening. Planning, organizing, and managing of production and systems. Managerial implications of automation. Study of skills and abilities essential to industrial management, including maintenance of equipment and real property.

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies.

261 *Economic Analysis in Engineering Planning* (3)

Fall—evening; spring—evening. Application of economic principles to engineering administration: inputs, outputs, investments, and prices. Studies are made of the methods of analyzing economic factors in evaluating alternate courses of administrative action in government and industry.

263 *Quantitative Techniques of Engineering Administration* (3)

Spring—evening. Application of the various quantitative techniques, mathematical, statistical, and other management sciences' techniques to the analysis of engineering administration and the solution of administrative problems by the use of models, theories, and measurements.

271 *Operations Research* (3)

Fall—evening; spring—evening. Background and application of operations research; history, characteristics, capabilities, administrative considerations, cases, methods, and techniques, including construction of conceptual and mathematical models.

272 *Problems in Operations Research* (3)

Spring—evening. Illustrations of the application of operations research by study of case histories: examples of the formulation and preliminary order-of-magnitude case; examples of broader scope.

273-74 *Techniques of Operations Research* (3-3)

Academic year—evening. Theory and application of techniques used in operations research, including order-of-magnitude estimation, probability and mathematical statistics, symbolic logic, inequality-constrained stationary-value problems, dynamics of populations, Monte Carlo simulation, strategic gaming, and error and sensitivity analysis.

295 *Applied Research in Engineering Administration* (arr.)

Fall—as arranged; spring—as arranged. Application of established principles to new engineering administrative situations; the development of new knowledge of administration.

296 *Research in Engineering Administration* (arr.)

Fall—as arranged; spring—as arranged. Creative thinking in engineering administration, initiation of new theories and principles, development of new hypotheses, experimentation, proof of theories and hypotheses.

299-300 *Thesis* (3-3)

Academic year—as arranged.

ENGINEERING SCIENCE

The following courses serve as foundations for specialization, since they are concerned with a body of knowledge applicable in a variety of engineering fields.

130 *Introductory Astronomy* (3)

Spring—evening. Coordinate systems and nomenclature used in astronomy, description of astronomical systems from solar system to metagalaxies, introduction to celestial mechanics, types of stars, stellar physics. Prerequisites: integral calculus and one year of college physics.

154 *Automatic Control** (4)

Spring—morning and evening. Theory of automatic control systems including electromechanical, pneumatic, and hydraulic systems. Transient analysis, transfer functions, stability criteria. Experimental study of automatic control systems. Lecture and laboratory. Prerequisite: Electrical Engineering 127 or Mechanical Engineering 123. Laboratory fee, \$11.

201 *Automatic Control* (3)

Fall—evening. Advanced theory of automatic control. Systems analysis, multiple-loop systems, nonlinear systems.

211 *Analysis of Engineering Systems I* (3)

Fall—evening; spring—evening. A course in the mathematical analysis of engineering systems employing such topics as complex variables, infinite series, orthogonal functions, matrices and vector spaces, partial differential equations, probability, and calculus of variations. The required level of preparation is equivalent to Mathematics 111 and 112 as given at this University.

212 *Analysis of Engineering Systems II* (3)

Fall—evening; spring—evening. Continuation of Engineering Science 211. Mathematical topics include: functions of complex variables, operational and transform methods, numerical solutions of differential equations, finite differences, matrices.

217 *Analytical Mechanics* (3)

Fall—evening; spring—evening. Fundamental principles, generalized coordinates, variational principles and Lagrange's equations, nonholonomic systems, Hamilton's equations, theory of small oscillations.

218 *Mechanics of Orbits and Trajectories* (3)

1960-61 and alternate years: fall—evening. Celestial mechanics. Orbits and trajectories in force fields. Dynamics of space vehicles.

220 *Nonlinear Mechanics* (3)

Spring—evening. Topological and analytical methods in nonlinear mechanics, nonlinear resonance, relaxation oscillations.

221 *Theory of Elasticity I* (3)

Fall—evening. Introduction to mathematical theory of elasticity, analysis of strain and stress, generalized Hooke's law, equilibrium equations, Beltrami-Michell equations, strain energy functions, torsion, general flexure.

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies.

222 *Theory of Elasticity II* (3)

1961-62 and alternate years: spring—evening. First and second boundary-value problems in plane elasticity, uniqueness of solutions, simply and multiply connected regions, three-dimensional problems, thermoelasticity, vibration of elastic solids, variational methods.

231 *Fluid Dynamics* (3)

Fall—evening. Theory of compressible and incompressible fluid motion including potential motion, circulation and vorticity, mathematical treatment of flow at sub-, trans-, and supersonic velocities, normal and oblique shock, and elements of heat transfer.

233 *Engineering Problems* (3)

Spring—evening. Investigation of problems in engineering science, emphasizing imaginative and systematic application of fundamental principles in engineering, physics, and mathematics.

241 *Science of Engineering Materials* (3)

1961-62 and alternate years: spring—evening. Relation of the atomic and microscopic structure of engineering materials to their physical and mechanical properties and their mechanical behavior in engineering applications.

299-300 *Thesis* (3-3)

Academic year—as arranged.

CIVIL ENGINEERING

224 *Theory of Plates and Shells* (3)

1960-61 and alternate years: spring—evening. Classical and modern theories of plates and shells, plates and cylindrical shells under different loadings and boundary conditions, equations for plates including shear, rotationally symmetric shells under small deformations and their applications.

226 *Plasticity of Solids* (3)

1961-62 and alternate years: fall—evening. Plastic flow and fracture of solids; theory of elastic perfectly plastic solids, including basic concepts, limit analysis of beams, rigid frames, and plane stress problems; theory of fracture.

234 *Geotechnics in Soil Mechanics* (3)

1960-61 and alternate years: fall—evening. Dynamic geology in the formation and properties of soils; Boussinesq and Westergaard equations for stresses and deformations in soil masses; analysis of settlement; flow of water in soils; solutions of Laplace-type equations for seepage involving foundations, earth dams, and wells; theory of frost action.

235 *Theoretical Soil Mechanics* (3)

1960-61 and alternate years: spring—evening. Theories of soil strength and conditions for failure, bearing capacity of footings, pile foundations, theories of lateral earth pressure, stability of slopes, soil dynamics.

251 *Theory of Structures I* (3)

Spring—evening. Classical and modern methods of structural analysis; basic theory of plane structures; statically indeterminate structures, including continuous beams and trusses and arches; limit-load analysis; special problems.

252 *Space Structures* (3)

1960-61 and alternate years: spring—evening. Theory of structures in three dimensions: trusses, rigid frames, and thin-shell structures.

253 *Theory of Structures II* (3)

1961-62 and alternate years: fall—evening. Statically indeterminate structural theory, including single and multi-span rigid frames and arches, deflection theory for arches and suspension bridges, thermal stress, and failure of structures.

256 *Theory of Elastic Stability* (3)

1960-61 and alternate years: fall—evening. Beam-column problems and methods of analysis (including numerical analysis); lateral buckling of beams; buckling of rigid frames, arches, plates, stiffened plates, and shells; inelastic buckling.

ELECTRICAL ENGINEERING

203 *Operational Analysis of Linear Systems* (3)

Fall—evening. Transient analysis of linear, lumped-parameter electrical and mechanical systems by operational methods with emphasis on Laplace transforms.

205 *Electronic Circuit Analysis* (3)

Spring—evening. Methods of linear and nonlinear analysis applied to passive and active networks including vacuum-tube and transistor circuits, and magnetic and dielectric amplifiers.

207 *Steady-state Network Analysis* (3)

Spring—evening. Analysis of lumped, linear networks: determinants, loop and node analysis, network theorems, four-terminal networks, filters, complex frequency, network functions, and general network properties.

209 *Electromagnetic Field Analysis* (3)

Fall—evening. Electrostatics, magnetics, and Maxwell's equations: solutions of Laplace's equation, retarded potentials, electromagnetic waves in bounded media, field analysis techniques.

211 *Physical Electronics* (3)

Fall—evening. Physical principles underlying operation of various electronic devices including vacuum tubes, electron lenses, transistors, and recent solid-state electronic devices.

215 *Analysis of Modulation and Noise* (3)

Spring—evening. Analysis by Fourier series and integrals of signals and linear networks, modulation and spectra, noise analysis including probability method of determining power spectra.

231 *Basic Concepts of Digital Computers* (3)

Spring—evening. The programmed system, logical and system design of digital computers, special-purpose digital computers, theory of switching circuits and computer logic, reliability, digital electronic circuits, modern developments.

MECHANICAL ENGINEERING

211 *Thermodynamics* (3)

Fall—evening. Reversible and irreversible processes, equilibrium, ideal and van der Waal's gases, dilute solutions, phase equilibria, electric and magnetic effects, radiation. Introduction to kinetic theory and statistical mechanics.

213 *Heat Transfer* (3)

Spring—evening. Physical and mathematical concepts of heat transfer phenomena under steady and unsteady conditions, including: Stefan-Boltzmann and Planck laws for radiation. Fourier heat equation for conduction, dimensional analysis, and boundary layer theory for convection.

215 *Gas Dynamics* (3)

Spring—evening. Theory of gas dynamics including: combustion, shock phenomena, dynamics of flow, and heat transfer for high temperature gases.

233 *Supersonic Flow and Shock Waves* (3)

Not offered 1960-61. Advanced theory of supersonic fluid flow. Shock phenomena, spherical waves.

REQUIRED AND ELECTIVE COURSES FROM
OTHER DEPARTMENTS

On the following pages appears a list of courses, offered in other departments of instruction, which are required in one or more of the engineering curricula.

Courses in the options of the Bachelor of Science in Engineering curriculum are to be selected from the offerings of the department of option with the approval of the executive officer of the department. A complete listing of courses in these departments appears in the general catalogue of the University.

Required elective courses in the humanities and social studies may be selected from the offerings of the following departments of instruction:

Art	Religion
Classical Languages and Literatures	Romance Languages and Literatures
English:	Slavic Languages and Literatures
American Literature	Economics
English Literature	Geography
Germanic Languages and Literatures	History
Philosophy	Political Science
	Sociology and Anthropology

Courses offered in these departments are described in the general catalogue of the University.

Electives (other than required electives in the humanities and social studies) taken to fulfill the 140 semester hour degree requirement need not be confined to the above list, but credit is not given for courses in Physical Education or Secretarial Studies. Credit is not given for English A, B, C; Mathematics 3, 6; or Speech B.

ACCOUNTING

115 *Survey of Accounting* (3)

Fall—evening. Accounting systems used by single proprietorships and corporations with emphasis on methods of compiling, analyzing, classifying, and summarizing accounting data and on use of accounting information in the management process; introduction to cost accounting, commercial budgeting, and interpretation of financial statements. Not open for credit to undergraduate Accounting or Business Administration majors.

215 *Survey of Managerial Accounting* (3)

Nature, preparation, analysis, and interpretation of accounting reports; study of cost accounting, business budgeting, and internal accounting controls with emphasis on their use in the management process.

293 *Budget Preparation and Control* (3)

Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial, industrial, and government organizations.

AIR SCIENCE

BASIC COURSE

1-2 *Leadership Laboratory—Freshman Year* (1-1)

Cadet basic airman training. Military courtesy, discipline, appearance, and bearing; element, flight squadron, and mass formation drill; parades and ceremonies. Minimum 15 hours a semester. Laboratory fee, charged one time a year, \$3. (May be substituted for Physical Education 1-2.)

11-12 Leadership Laboratory—Sophomore Year (1-1)

Cadet noncommissioned officer training. Military bearing and courtesy, all phases of drills and ceremonies, command voice training and command responsibility. Prerequisite: Air Science 1-2, 21 and 22, for men and Air Science 1-2 for women. Minimum 15 hours a semester. Laboratory fee, charged one time a year, \$3. (May be substituted for Physical Education 11-12.)

21 Air Science—Freshman Year (2)

Foundations of Air Power. General survey of air power designed to provide the student with an understanding of the elements and potentials of air power. Fundamentals of air power; military air powers of the world, military research and development, air vehicle industries; air lines and airways; general aviation; elements of an aircraft; and aerodynamics.

22 Air Science—Freshman Year (2)

Foundations of Air Power. General survey of air power to include, control, navigation, and propulsion systems; space vehicles; military instruments of national security; and professional opportunities in the United States Air Force.

51 Air Science—Sophomore Year (2)

Foundations of Air Power. General survey of the roots and development of aerial warfare emphasizing the principles of war, concepts of employment of forces, and the impact of changing weapon systems. Treatment of aerial warfare is undertaken to include targets and weapons.

52 Air Science—Sophomore Year (2)

Foundations of Air Power. Treatment of aerial warfare is continued including aircraft and missiles, bases and facilities, and operations.

ADVANCED COURSE

101 Air Science—Junior Year (3)

Air Force Officer Development. Knowledge and skills required of a junior officer in the Air Force. Staff organization and functions, communicating, instructing, and techniques of problems solving.

102 Air Science—Junior Year (3)

Basic psychology of leadership, the military justice system, and application of problem solving techniques and leadership theory to simulated and real Air Force problems.

103-4 Leadership Laboratory—Junior Year (Credit is a part of Air Science 101 and 102)

Cadet noncommissioned officer and officer training. Wearing of the uniform, parades and ceremonies, commands and command voice. Cadets perform duties involving planning for and supervision of Cadet Corps activities. Emphasis placed on leadership and management proficiency. Minimum 15 hours a semester.

105 *Summer Training Unit—Between Junior and Senior Years*
(required)

Attendance at a four-week Air Force ROTC summer training unit at an Air Force base within continental United States is mandatory. Program consists of familiarization flying, physical training, individual weapons, Air Force base activity and equipment, field exercises, air base problems, and leadership training.

151-52 *Air Science—Senior Year* (3-3)

Leadership and management seminar; military aviation and the evolution of warfare; military aspects of world political geography; briefing for commissioned service.

153-54 *Leadership Laboratory—Senior Year*
(Credit is a part of Air Science 151-52)

Cadet officer training. Cadet officers conduct activities of Corps of Cadets through chain of command, instruct subordinates, plan and supervise Cadet Corps training and administration. Preparation for commissioned officer duties. Development of leadership and managerial responsibilities. Minimum 15 hours a semester.

BUSINESS AND PUBLIC ADMINISTRATION

BUSINESS ADMINISTRATION

250 *Contract Administration* (3)

Primarily for students in the Engineering Administration program. The administration, negotiation, and renegotiation of contracts between the government and industry for engineering, scientific, and other professional services, facilities, and materials. Contract policies; fixed-price and cost-plus-fixed-fee, bidding, etc.

PUBLIC ADMINISTRATION

213 *Administration in Government* (3)

Selected topics in problems of Federal administration, with particular attention to the role of Congress and the public in the Administrative processes.

CHEMISTRY

11-12 *General Chemistry* (4-4)

A year course: credit is not given for the first half until the second half is completed. Lecture, laboratory, and recitation. Prerequisite: one year of high school algebra. Laboratory fee, \$18 a semester.

ENGLISH

A *English Practice**

Instruction, drill, and exercises in grammar, vocabulary, spelling, and mechanics in general; instruction and exercises in composition and reading. This course is designed to prepare students for English I.

* Credit is not given for English A, B, C; Mathematics 3, 6; or Speech B.

B English for Foreign Students † (3)

A course in reading and writing designed to prepare the student for English 1. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary.

C English for Foreign Students † (3)

For second-semester foreign students not yet ready for English 1. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style.

1 English Composition* (3)

Review of grammar, exercise in composition, readings.

2 English Composition* (3)

The second half of the six-hour English Composition course required of all students. Readings and practice in expository and argumentative techniques and in research procedure.

MATHEMATICS

3 College Algebra† (3)

Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

6 Plane Trigonometry† (3)

Prerequisite: two years of high school algebra and one year of high school geometry or Mathematics 3 (or concurrent registration therefor).

12 Analytic Geometry (3)

Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry.

29 Calculus I (3)

Differentiation and integration of polynomial functions, with applications. Prerequisite or concurrent registration: Mathematics 12.

30 Calculus II (3)

Differentiation and integration of transcendental functions, with applications; the mean value theorem and applications. Prerequisite: Mathematics 12, 29.

* Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared for English 1 will be assigned to English A. English 1 is prerequisite to all other courses in English.

† Credit is not given for English A, B, C; Mathematics 3, 6; or Speech B.

31 *Calculus III* (3)

Infinite series, solid analytic geometry, partial differentiation, multiple integrals, introduction to vector concepts, improper integrals. Prerequisite or concurrent registration: Mathematics 30.

111 *Mathematics for Engineers and Physicists I* (3)

Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 30, 31.

112 *Mathematics for Engineers and Physicists II* (3)

Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 103, 111, or 132.

PHYSICAL EDUCATION

1-2 *Freshman Physical Education* (1-1)

Two periods of supervised activity a week. Locker and towel fee, \$4.50 a semester.

11-12 *Sophomore Physical Education* (1-1)

Two periods of supervised activity a week. Locker and towel fee, \$4.50 a semester.

PHYSICS

11 *Introductory Physics* (3)

Light, heat, force, energy, introduction to vectors; and the properties of matter. Prerequisite: high school algebra and plane geometry. Lecture, laboratory, and recitation. Material fee, \$11.

14 *General Physics* (3)

Mechanics, wavemotion, and sound. Prerequisite: Physics 11. Prerequisite or concurrent registration: Mathematics 29. Lecture, laboratory, and recitation. Material fee, \$11.

15 *General Physics* (3)

Electricity and magnetism. Prerequisite: Physics 14. Prerequisite or concurrent registration: Mathematics 30. Lecture, laboratory, and recitation. Material fee, \$11.

16 *General Physics* (3)

Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30, and consent of the instructor.

116 *Quantum and Solid State Physics* (3)

Primarily for engineers. Prerequisite: Physics 16, Mathematics 111.

191 *Nuclear Reactors* (3)

Neutron physics: sources of neutrons, neutron reactions, slowing down and diffusion; introduction to transport theory; fission process; reactor types; basic theory of homogeneous and heterogeneous reactors, including specific numerical studies from recent publications. Prerequisite: Physics 16, Mathematics 31.

PSYCHOLOGY

145 *Principles of Human Relations* (3)

Primarily for students in the Engineering Administration program. Survey of the psychological principles involved in dealing with individuals and groups.

STATISTICS

107 *Statistics for Engineers* (3)

Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering application. Prerequisite: differential and integral calculus.

262 *Managerial Statistics and Quality Control* (3)

Primarily for students in the Engineering Administration program. The application of statistical principles and practices to management and quality control. Emphasis is placed on the use of statistical techniques in making management decisions, controlling quality and standardization. Prerequisite: Statistics 107 or the equivalent.

271-72 *Statistical Information Theory* (3-3)

A year course; credit is not given for the first half until the second half is completed. Basic concepts, definitions, and formulas of information theory; their significance and general properties. Shannon's coding theorem, channel capacity, and transmission of information; inequalities of information theory and sufficiency; applications to statistical problems of discrimination and hypothesis testing; asymptotic distribution theory of information; analysis of contingency tables; loss of information due to grouping and sequential analysis; comparison of experiments.

ALUMNI AND ALLIED ASSOCIATIONS

THE GENERAL ALUMNI ASSOCIATION

The objects of this Association are to unite the graduates in closer sympathy and to promote the general welfare of the University. The following persons are eligible for *active* membership: graduates of any college, school, or division of the University; holders of honorary degrees from the University; and members of the Board of Trustees and of the Faculty of the University. Any person who has matriculated, who has been in regular attendance for one year, and who has left the University in good standing, is eligible for *associate* membership.

The University, in June 1958, provided new quarters for the Office of Alumni Relations in Bacon Hall, 2000 H Street NW., Washington 6, D. C. The General Alumni Association completed furnishing a reception room in November 1958 dedicated to the use of alumni and alumni organizations.

All Alumni are urged to keep the office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

THE ENGINEER ALUMNI ASSOCIATION OF THE GEORGE WASHINGTON UNIVERSITY

The Engineer Alumni Association was organized in 1936 and has been affiliated with the General Alumni Association since that time. Its objects are to unite the graduates and Faculty of the School of Engineering in closer fellowship, to promote the general welfare of the School of Engineering and of the University at large, to foster activities of the engineering organizations recognized by the University, and to advance the profession of engineering in general.

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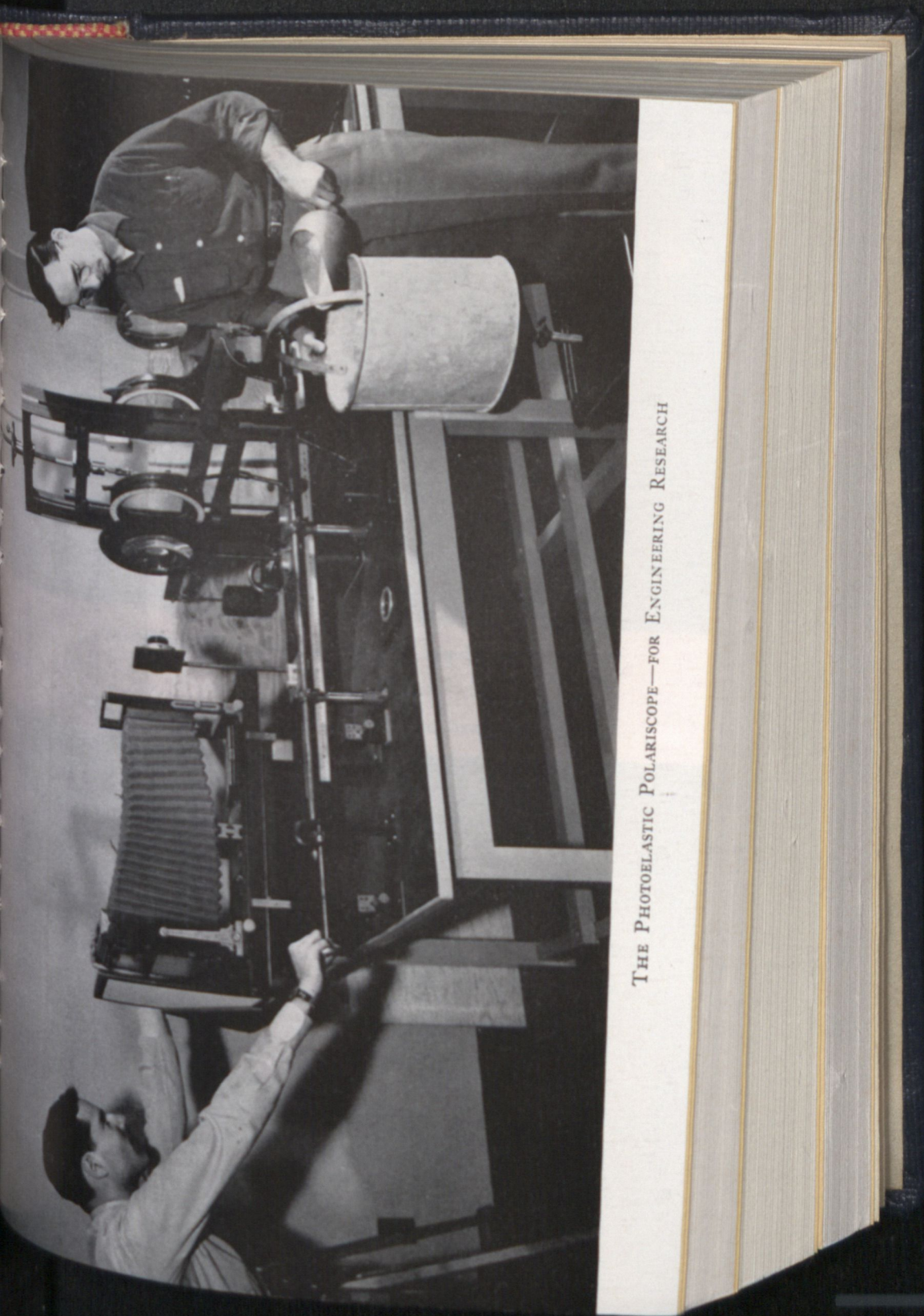
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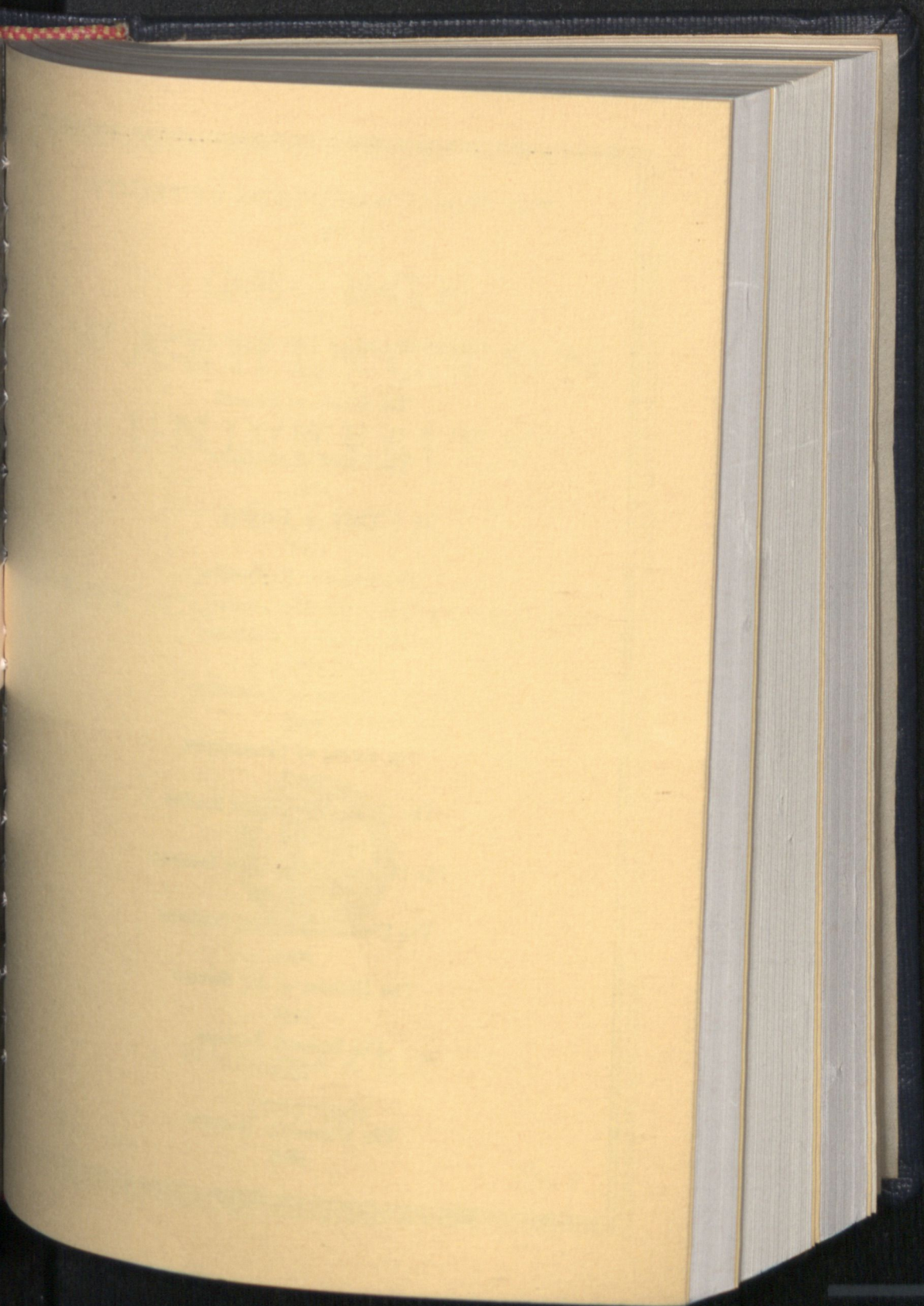
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CLASS BREAK, TOMPKINS HALL OF ENGINEERING

ELECTRONICS—AN ESSENTIAL IN MODERN ENGINEERING





THE GEORGE WASHINGTON UNIVERSITY

1821

The Junior College

1930

Columbian College (the Senior College)

1821

The Graduate Council

1893

The School of Medicine

1825

The Law School

1865

The School of Engineering

1884

The School of Pharmacy

1906

The School of Education

1907

The School of Government

1928

The College of General Studies

1950

The Division of University Students

1930

The Division of Special Students

1944

The Division of Air Science

1951

The Summer Sessions

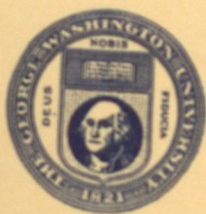
1916

The University Hospital

1898

THE
GEORGE
WASHINGTON
UNIVERSITY
BULLETIN

THE SCHOOL OF EDUCATION
1960-61



WASHINGTON 6, D. C.

JUNE 1960

VOL. LIX

No. 7

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AT WASHINGTON, D. C.
JANUARY, FEBRUARY, APRIL, JUNE, JULY, AUGUST, OCTOBER, NOVEMBER, AND
DECEMBER

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UNIVERSITY

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BY THE UNIVERSITY

No. 7

1912

THE SCHOOL OF EDUCATION

WASHINGTON, D. C.

PUBLISHED IN 1912

BY THE UNIVERSITY

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CALENDAR OF THE SCHOOL OF EDUCATION

1960-61

Date	Day	Occasion
1960		
FALL SEMESTER:		
Sept. 15	Thurs.	Orientation Assembly, for all new students
Sept. 16 and 19	Fri. and Mon.	Curriculum assemblies*
Sept. 20	Tues.	Placement tests
Sept. 22-24	Thurs.-Sat.	Registration†
Sept. 26	Mon.	Classes begin
Oct. 7	Fri.	Last day for February Master's candidates to file subjects of theses in Dean's Office
Oct. 9	Fri.	Dissertation subjects of June Ed.D. candidates due in Dean's Office
Oct. 22	Sat.	Fall Convocation
Oct. 24	Mon.	General Education activities plans due‡
Oct. 28	Fri.	Activities plans due
Oct. 31	Mon.	Last day for applying in Registrar's Office for February graduation
Nov. 4	Fri.	Graduate Studies Committee meets
Nov. 5	Sat.	Applications for November Ed.D. comprehensive examinations due
Nov. 11	Fri.	Veterans Day holiday
Nov. 19	Sat.	Ed.D. comprehensive examinations
Nov. 24-26	Thurs.-Sat.	Thanksgiving recess
Dec. 17	Sat.	Ed.D. and A.M. in Ed. January comprehensive examination applications due
Dec. 22-Jan. 2	Thurs.-Mon.	Christmas recess
1961		
Jan. 3	Tues.	Classes resume
Jan. 7	Sat.	Theses and dissertations of February candidates due
Jan. 19	Thurs.	Ed.D. and A.M. in Ed. comprehensive examinations
Jan. 20	Fri.	Graduate Studies Committee meets
Jan. 23-31	Mon.-Tues.	Inauguration Day holiday
		Examination period

* All new students are expected to attend one Curriculum Assembly.
 † September 22 and 23, from 10:00 A.M. to 8:00 P.M.; September 24, from 10:00 A.M. to 1:00 P.M.
 ‡ A.B. in Ed. candidates admitted in the fall semester, 1960.

CALENDAR OF THE SCHOOL OF EDUCATION—Continued

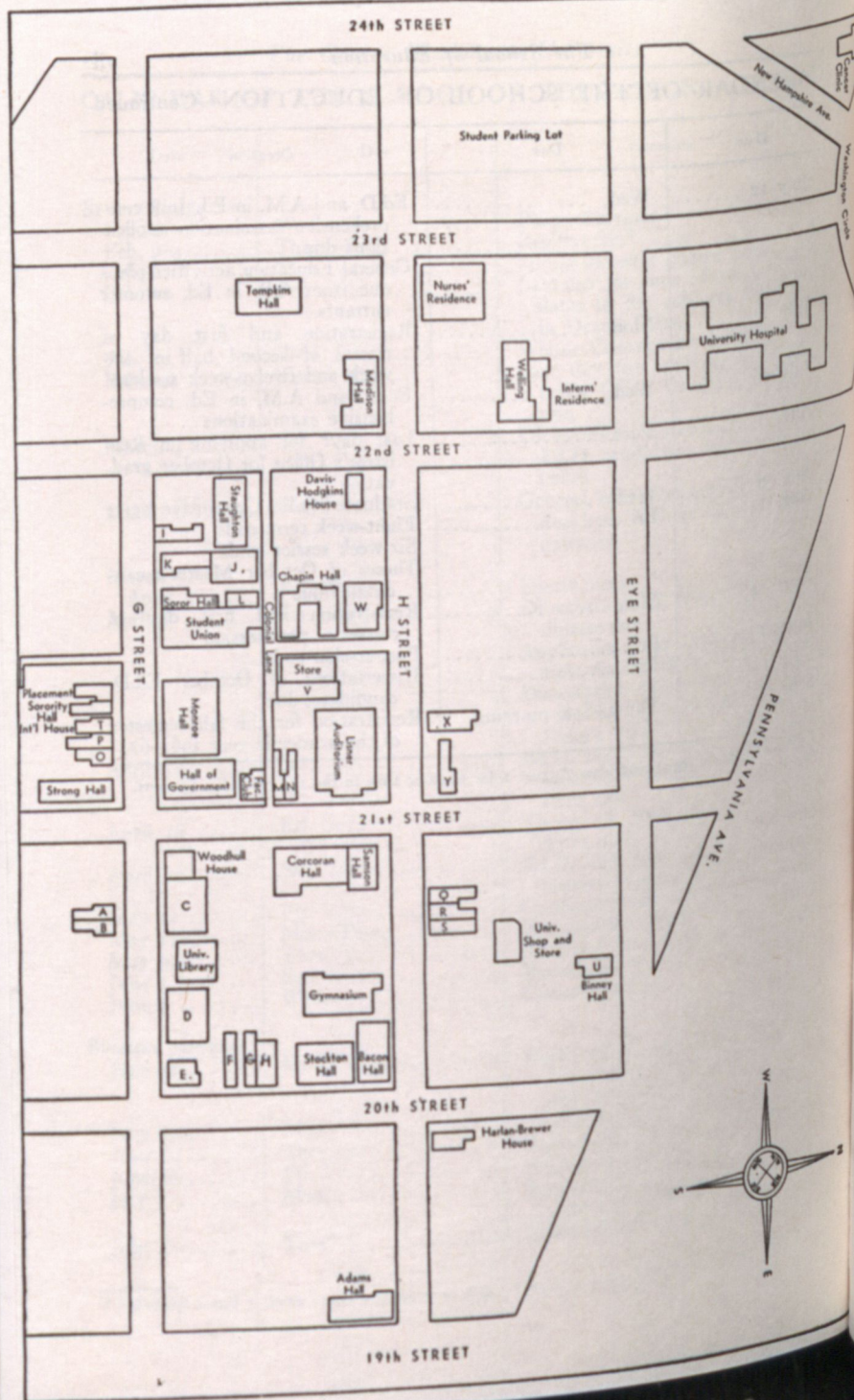
Date	Day	Occasion
SPRING SEMESTER:		
Feb. 1	Wed.	Placement tests
Feb. 2-4	Thurs.-Sat.	Registration*
Feb. 6	Mon.	Spring-semester classes begin
Feb. 10	Fri.	Last day for June Master's candidates to file subjects of theses in Dean's Office
Feb. 22	Wed.	Winter Convocation holiday
Feb. 28	Tues.	Last day for applying in Registrar's Office for June graduation
March 4	Sat.	Dissertation subjects of October Ed.D. candidates due in Dean's Office
March 6	Mon.	General education activities plans due from A.B. in Ed. February entrants
March 31- April 5	Fri.-Wed.	Easter recess
April 8	Sat.	Dissertations of June Ed.D. candidates due
		Applications for scholarships for 1961-62 should be filed
		Dissertation subjects of February 1962 Ed.D. candidates due in Dean's Office
April 15	Sat.	Ed.D. and A.M. in Ed. April comprehensive examination applications due
April 28	Fri.	Theses of June Master's candidates due
April 29	Sat.	Ed.D. and A.M. in Ed. comprehensive examinations
May 12	Fri.	Graduate Studies Committee meets
May 22-31	Mon.-Tues.	Examination period
May 30	Tues.	Memorial Day holiday
June 4	Sun.	Baccalaureate
June 7	Wed.	Commencement
SUMMER SESSIONS:		
June 12	Mon.	Registration and first day of classes of pre-session and twelve-week session
June 19	Mon.	Registration for eight-week term
June 20	Tues.	Eight-week classes begin
June 30	Fri.	Pre-session ends
July 3	Mon.	Registration and the first day of classes of six-week session
July 4	Tues.	Independence Day holiday

* February 2 and 3, from 10:00 A.M. to 8:00 P.M.; February 4, from 10:00 A.M. to 1:00 P.M.

CALENDAR OF THE SCHOOL OF EDUCATION—Continued

Date	Day	Occasion
July 12	Wed.	Ed.D. and A.M. in Ed. July comprehensive examination applications due
July 24	Mon.	General Education activities plans due from A.B. in Ed. summer entrants
July 26	Wed.	Registration and first day of classes of second half of six-week and twelve-week sessions
Aug. 1	Tues.	Ed.D. and A.M. in Ed. comprehensive examinations
Aug. 9	Wed.	Last day* for applying in Registrar's Office for October graduation
Aug. 11	Fri.	Graduate Studies Committee meets
Aug. 14	Mon.	Eight-week term ends
Sept. 1	Fri.	Six-week session ends
Sept. 8	Fri.	Theses of October Master's candidates due
Sept. 21-23 ...	Thurs.-Sat. morning ..	Registration and first day of classes of post-session
		Post-session ends
		Dissertations of October Ed.D. candidates due
		Registration for the fall semester of the academic year 1961-62

* Except students registering after August 1 for the first time in the 1961 Summer Sessions.



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 † On sabbatical leave spring semester 1960-61.

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GENERAL INFORMATION

INTRODUCTORY

It is the purpose of the School of Education to prepare teachers, counselors, and administrators for the higher ranges of educational service and to offer opportunities to teachers of experience to extend their education. The School includes the departments of Education, Physical Education, and Home Economics.* It offers both graduate and undergraduate work. Other departments of the University provide general education and subject-matter courses needed for a well-balanced program of teacher education.

Special curricula are provided for liberal arts graduates, housewives, and retired military personnel who wish to prepare for teaching. The School also provides a wide range of courses of interest to emergency teachers who wish to qualify for teaching certificates and teachers who wish to renew licenses.

Laboratory and clinical facilities are provided by the University Reading and Speech clinics. In cooperation with public and private schools and a wide variety of social agencies, ample opportunity for field experience is provided.

The schedule of courses is arranged to meet the convenience of both full-time and part-time students. By attending evening, Saturday, and summer classes, teachers in the schools of the metropolitan Washington area and others within commuting range may complete all the requirements for a degree without giving up their positions.

HISTORICAL DEVELOPMENT

The University began offering professional courses for teachers in 1904-5 and in 1907 it established a Division of Education. In 1909, the Division of Education became the Teachers College which, in its early years, was concerned largely with teacher preparation on the undergraduate level.

In 1928, the Teachers College became the School of Education and greater provision was made for advanced study. Since that time the graduate enrollment has steadily increased with the result that today the School has a considerably larger number of graduate than undergraduate students.

ADVANTAGES OF STUDY IN THE NATION'S CAPITAL

Washington is rich in the resources needed by teachers, counselors, and administrators to supplement classroom instruction. In addition to the

* The Department of Home Economics offers a curriculum in home-making. Its program is described in a special announcement.

library facilities of the University, the Library of Congress; the Library of the Department of Health, Education, and Welfare; and many special collections provide unexcelled opportunities for reading and research. The operation of all branches of the National Government may be observed. Among the art galleries are the National Gallery of Art, the Corcoran Gallery of Art, the Freer Art Gallery, Phillips Memorial Gallery, and the National Museum. The music calendar of Washington is a full one, and includes concerts by the National Symphony Orchestra, Philadelphia Orchestra, and the Boston Symphony Orchestra. Those interested in science find many resources for study at the National Museum, the National Zoological Park, the United States Botanic Garden, and the Aquarium of the Fish and Wildlife Service, Department of the Interior. Students have unique opportunities to become acquainted with the work of the Office of Education, the National Education Association, the American Council on Education, and many other national organizations with headquarters in Washington.

ACADEMIC STATUS

The George Washington University is accredited by the regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The School of Education is accredited by the National Council for Accreditation of Teacher Education, is a member of the American Association of Colleges for Teacher Education, and was a charter member of the National Association of Colleges and Departments of Education prior to the merger of that association with others to form the American Association of Colleges for Teacher Education.

THE EDUCATION OF TEACHERS

Programs of study for the education of teachers are based upon the assumption that every teacher should have a broad general education, adequate mastery of the content of instruction, and professional competence.

The relative emphasis placed upon each of these aspects of the total education of teachers varies in accordance with the purposes of each program. For instance, elementary school teachers, since they teach all subjects, require content preparation of greater breadth and less specialization than secondary school teachers.

It is the view of the School of Education that an acceptable minimum education for teaching requires not less than four years of full-time study or the equivalent part-time study. For superior preparation teachers are urged to plan for five years of full-time study or the equivalent part-time study.

The student may choose any one of the following three plans to achieve superior educational preparation for teaching:

1. Upon receiving the Bachelor's degree, he may take a teaching position and, after acquiring some professional experience, return to the School for graduate study leading to the Master's degree. This plan enables students with Bachelor's degrees to start earning immediately and, by teaching experience, to illuminate graduate study which will follow. However, by delaying acquisition of the Master's degree the student cannot command the higher salary usually associated with this degree and may prejudice his opportunity for promotion.

2. The student may choose to pursue full-time graduate study leading to the Master's degree immediately after receiving the Bachelor's degree. This plan is of advantage to students who wish to defer the decision to seek a Master's degree until completion of the undergraduate program and to students transferring from other institutions, whose transferred credits fit more readily into this plan than into the five-year plan discussed below. Both this program and the five-year program enable the student to command a higher beginning salary and be considered for early promotion.

3. For those whose professional aims are established at the beginning of the junior year, the School offers a five-year integrated program of study leading to the Bachelor's and Master's degrees conferred simultaneously. This program permits careful planning from the outset to meet the demands of the teaching position for which the student is preparing; it permits adequate mastery of the content of instruction in two teaching fields; and advances the professional sequence of courses to the

- fourth and fifth years, thus providing a more adequate academic preparation. Students are advised to choose the five-year program if possible.

The first two years of all programs of study are administered by the Junior College of the University. During these two college years the student is encouraged to follow the curriculum designed to prepare him for the program of studies he wishes to pursue later in the School of Education. Students who have followed other Junior College curricula may be admitted to the School of Education with deficiencies which they must make up before graduation. Members of the Faculty of the School of Education serve as advisers to students enrolled in Junior College curricula leading to degree programs in the School of Education. At each registration students must have their programs approved by their advisers. They are also urged to seek counsel in the budgeting of time for the inclusion of nonacademic student activities and off-campus cultural opportunities for the development of a well-rounded personality.

THE BACHELOR'S DEGREES

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION FOR MEN*

There are three curricula leading to this degree. The Single-Major and Subject-Certification Teacher's Curriculum is designed to prepare students for teaching positions in smaller schools where it is necessary to teach an academic subject in addition to physical education. The Single-Major Teacher's Curriculum prepares for the teaching of physical education in the larger schools. The Physical Education and Recreation Curriculum has been planned for those who wish to be prepared to direct programs of recreation in addition to the teaching of physical education.

PREREQUISITE

The following two-year curriculum offered in the Junior College, is required for admission to the School of Education as a candidate for the degree of Bachelor of Science in Physical Education for Men.

	Semester Hours
English	6
Physical Education	4
Science	6 or 8
Social Studies	12
English 1, 2	6
Physical Education 1-2, 11-12	4
Science	6 or 8
Social Studies	12
Biology 1-2 or Zoology 1-2 (Freshman year)	6
History 39-40, 71-72; Political Science 1 and 9, 1 and 10, or 9-10; or Sociology and Anthropology 1-2	12

* Physical Education may also be chosen as a minor teaching field by candidates for the degree of Bachelor of Arts in Education. See pages 23-24.

	Semester Hours
Major Prerequisites..Physical Education 43-44, 47; Speech I or II (Fresh- man year)	9
Physical Education 45-46, 49, 50, 58; Psychology I, 22 (Sophomore year).....	18
Elective	7-9
Total.....	64

The minimum requirements for this degree are 66 semester hours, distributed as follows:

Single-Major and Subject-Certification Teacher's Curriculum

The minimum requirements for this degree are 21 semester hours in education, 24 hours in physical education, 18 hours in an academic teaching field, and 3 hours in physiology, distributed as follows:

JUNIOR YEAR		SENIOR YEAR	
	Semester Hours		Semester Hours
Human Development, Learning, and Teaching	6	Common Teaching Skills in Sec- ondary Schools	3
Society and the School	6	Observation and Student Teach- ing in Secondary Schools	6-9
History and Principles of Physi- cal Education	3	Methods and Materials for Teach- ing Team Sports in Secondary Schools	4
Adapted Physical Education and Physical Examinations	3	Methods and Materials for Health Education	3
Techniques for Teaching Recrea- tional Dance	1	Tests and Measurements in Phys- ical Education	3
Methods and Practice in Teaching Physical Education Activities	4	Organization and Administration of Physical Education	3
Physiology	3	Academic teaching field.....	11
Academic teaching field	7	Total.....	33
Total.....	33		

Single-Major Teacher's Curriculum

The minimum requirements for this degree are 21 semester hours in education, 28 hours in physical education, 3 hours in physiology, and 14 hours of electives:

JUNIOR YEAR		SENIOR YEAR	
	Semester Hours		Semester Hours
Human Development, Learning, and Teaching	6	Common Teaching Skills in Sec- ondary Schools	3
Society and the School	6	Observation and Student Teach- ing in Secondary Schools	6
History and Principles of Physi- cal Education	3	Adapted Physical Education and Physical Examinations	3
Techniques for Teaching Recrea- tional Dance	1	Methods and Materials for Health Education	3
Leadership Organization in the Intramural Program	4	Tests and Measurements in Phys- ical Education	3

	Semester Hours		Semester Hours
Methods and Practice in Teaching Physical Education Activities.	4	Organization and Administration of Physical Education	3
Methods and Materials for Teaching Team Sports in Secondary Schools	4	Electives	12
Physiology	3	Total	33
Electives	2		
Total	33		

Physical Education and Recreation Curriculum

The minimum requirements for this curriculum are 66 semester hours, distributed as follows:

JUNIOR YEAR	Semester Hours	SENIOR YEAR	Semester Hours
Human Development, Learning, and Teaching	3	Common Teaching Skills in Sec- ondary Schools	3
Society and the School	6	Observation and Student Teach- ing in Secondary Schools	6-9
Introduction to Recreation	2	History and Principles of Physi- cal Education	3
Techniques for Teaching Recrea- tional Dance	1	Methods and Materials for Health Education	3
Leadership Organization in the Intramural Program	4	Tests and Measurements in Physi- cal Education	3
Methods and Practice in Teaching Physical Education Activities	4	Organization and Administration of Physical Education	3
Camp Leadership	1	Community Organization for Rec- reation	3
Recreational Leadership Activities	6	Administration of Community Recreation Programs	3
Electives	6	Electives	6
Total	33	Total	33

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION FOR WOMEN*

There are three curricula leading to this degree. The Dual-Major Teacher's Curriculum is designed to prepare students for teaching positions in smaller schools where it is necessary to teach an academic subject in addition to physical education. The Single-Major Teacher's Curriculum prepares for the teaching of physical education in the larger schools. Within this curriculum there is opportunity for specialization in dance, sports, or correctives. The Physical Education and Recreation Curriculum has been planned for those who wish to be prepared to direct programs of recreation in addition to teaching physical education.

* Physical Education may also be chosen as a minor teaching field by candidates for the degree of Bachelor of Arts in Education. See pages 23-24.

PREREQUISITE

The following two-year curriculum offered in the Junior College is required for admission to the School of Education as a candidate for the degree of Bachelor of Science in Physical Education for Women.

	Semester Hours
English	English 1, 2..... 6
Physical Education	English 51-52, 71-72, or 91-92..... 6
Science	1-2, 11-12..... 4
Social Studies	Biology 1-2 or Zoology 1-2..... 6 or 8
Major Prerequisites.....	History 39-40, 71-72; Political Science 1 and 9, 1 and 10, or 9-10; or Sociology and Anthropology 1-2... 6
	Physical Education 43-44 (Freshman year)..... 4
	Physical Education 49, 50, 51-52; Psychology 1, 22 (Sophomore year)..... 16
Academic Electives .. (Each year)	6 or 8
Total.....	64

Dual- or Single-Major Teacher's Curricula

The student wishing to prepare herself to teach another subject in addition to Physical Education for Women may do so by choosing her elective hours from one subject-matter field with the advice of the Dean of the School of Education. Relevant work completed in the Junior College may be counted in this subject-matter field.

JUNIOR YEAR	Semester Hours	SENIOR YEAR	Semester Hours
Human Development, Learning, and Teaching	6	Society and the School	6
Physical Education in the Elementary School	3	Observation and Student Teaching in Secondary Schools	6
History and Principles of Physical Education	3	Methods and Practice in Teaching Physical Education Activities.....	4
Adapted Physical Education and Physical Examinations	6	Methods and Materials for Health Education	3
Techniques for Teaching Recreational Dance	1	Tests and Measurements in Physical Education	3
Methods and Materials for Teaching Physical Education Activities	4	Organization and Administration of Physical Education	3
Methods of Teaching Modern Dance	1	Elective or subject-matter field..	9
Dance Production	1	Total	34
Camp Leadership	1		
Physiology	3		
Elective or subject-matter field..	3		
Total.....	32		

Physical Education and Recreation Curriculum

JUNIOR YEAR		Semester Hours	SENIOR YEAR		Semester Hours
Introduction to Recreation	2		Society and the School		6
Physical Education in the Ele- mentary School	3		Observation and Student Teach- ing in Secondary Schools		6
Adapted Physical Education and Physical Examinations	6		History and Principles of Phys- ical Education		3
Leadership Organization in the Intramural Program	4		Techniques for Teaching Recre- ational Dance		1
Methods and Materials for Teach- ing Physical Education Activi- ties	4		Methods and Practice in Teaching Physical Education Activities.		4
Methods of Teaching Modern Dance	1		Methods and Materials for Health Education		3
Dance Production	1		Camp Leadership		1
Recreational Leadership Activities	6		Organization and Administration of Physical Education		3
Physiology	3		Community Organization for Rec- reation		3
Elective	3		Administration of Community Recreation Programs		3
Total.....	33		Total.....		33

BACHELOR OF ARTS IN EDUCATION

Programs leading to the degree of Bachelor of Arts in Education have four main objectives: (1) provision of general educational backgrounds, (2) a functional command of ideas, concepts, knowledges, and skills in one or more teaching fields, (3) a mastery of basic professional information and skills adequate for a beginning teacher, and (4) development of attitudes needed for success in teaching. Since the contents of teaching fields differ in scope and complexity, some programs are longer than others in terms of semester hours. None require less than 126 semester hours of satisfactory work, exclusive of required Physical Education.

Normally, from 60 to 64 semester hours of the total requirement are completed in the Junior College of the University or in an equivalent institution elsewhere.

GENERAL EDUCATION

The general educational backgrounds needed by prospective teachers are obtained through: (1) precollege education, (2) college courses, (3) work experience, (4) leadership activities, (5) participation in student campus activities, and (6) utilization of off-campus cultural opportunities.

College course requirements of the pre-Education curriculum.—Course requirements depend in part upon the senior high school credits presented for college admission. They are as follows:

English

Semester
Hours 6

English 1, 2: English Composition
Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both semesters of the English Composition course; those who are inadequately prepared are assigned to English 1x. English 1 is a prerequisite to all other courses in English.

One of the following survey courses in literature..... 6
English 51-52: Introduction to English Literature
English 71-72: Introduction to American Literature
English 91-92: Introduction to European Literature

Foreign Languages

French, German, Latin, Russian, or Spanish..... 12
A student offering for admission four acceptable high school units of a single foreign language, or the equivalent, is not required to take any foreign language. If he offers three units, he must complete the second semester of the second-year college course in the same language. If he offers two units, he must complete the entire second-year college course in the same language. If he offers one unit, he must complete the second semester of the first-year college course and the second-year course in the same language.

Physical Education

Physical Education 1-2 and 11-12
A student may be exempted from this requirement if registered for less than three courses or regularly employed during the day.

Science and Mathematics

Two semesters of science or mathematics to supplement senior high school courses in these fields and chosen from the following..... 6-8
Biology 1-2: Survey in Biology
Botany 1-2: General Botany
Chemistry 3-4: Survey of Physical Sciences
Chemistry 11-12: General Chemistry
Mathematics 2 and 3: General Mathematics and College Algebra, or 3 and 6 College Algebra and Plane Trigonometry, or 6 and 12 Plane Trigonometry and Analytic Geometry
Physics 11, 12: Introductory Physics
Zoology 1-2: Introduction to Zoology

Social Studies

History 71-72: The Development of the Civilization of the United States 6
Another Social Science chosen from the following courses..... 6
Economics 1-2: Principles of Economics
Geography 51, 52: Introduction to Geography; World Regions

History 39-40: The Development of European Civilization
 Political Science 1 and 9, 1 and 10, or 9-10: Introduction to
 Government; Government of the United States
 Religion 59-60: History of Religions
 Sociology and Anthropology 1-2: Man in Modern Society
 A student offering for admission two or more acceptable senior
 high school units in the Social Studies may be exempted from this
 requirement

Other Courses

Psychology 1: General Psychology	3
Psychology 22: Educational Psychology; Speech 1: Effective Speak- ing; Speech 11: Voice and Diction.....	3
Students who demonstrate marked superiority in Speech may be exempted from this requirement. Such exemption is granted only on the recommendation of the Department of Speech.	
Statistics 53: Introduction to Statistics in Psychology and Education	3

Academic Electives

Electives may be increased through the various exemptions

Minimum required credits.....

Work experience, leadership activities, participation in student campus activities, and the utilization of off-campus cultural opportunities.—Obviously, these cannot be prescribed. Nevertheless, they constitute an important part of the general educational background of prospective teachers. In conference with a staff member of the Department of Education assigned as his general adviser, the student is expected to plan adequate experiences in these areas. Not later than one month after matriculation in the School of Education the student must file in the Office of the Dean a statement of such plans approved by his adviser. He must also keep his adviser informed concerning the fulfillment of his plans and to this end include in plans filed, scheduled conferences with his adviser.

Success of the student in enriching his general educational background by these means will be taken into consideration at the end of the first semester of the junior year when the faculty will review the qualifications of candidates to determine any who are not of sufficient promise as prospective teachers to warrant continuation of their candidacies. Success in these activities will also be considered when the list of candidates is again reviewed early in the last semester of the senior year immediately after the results of the National Teacher Examinations are available. In estimating the success of the student in this connection, more weight will be given to evidence of initiative, eagerness to make the most of each

experience, balance, and quality of experience than to the number of different experiences.

Although the student is not required to establish a program of non-academic activities until he becomes a degree candidate in the School of Education, he is advised to do so as soon as he enters the Junior College. To this end, he should consult with the Junior College adviser of students in the pre-Education curriculum soon after entering the Junior College. Whatever is accomplished in this connection while in the Junior College will reduce the obligations of the student after admission to the School of Education.

TEACHING-FIELD PREPARATION

Teaching-field preparation depends upon the kind of teaching position for which the student is preparing. Those planning to teach in elementary schools need a degree of competency in several fields. Those preparing to teach in junior or senior high schools must demonstrate competency in a major teaching field and a minor teaching field. Ordinarily, students preparing to teach in evening schools for adults are required to prove competency in only one teaching field.

The student should begin teaching-field preparation while in the Junior College and should make provision for it in planning his program of studies.

Teaching-field requirements include satisfactory completion of prescribed academic courses in one or more fields, a satisfactory score on the special field examination of the National Teacher Examinations, and satisfactory completion of the prescribed special methods courses.

Prescribed academic courses vary in number in accordance with the scope and complexity of the teaching field and the license requirements of the various states. Minimum academic course requirements for each major teaching field are listed on succeeding pages. Minor teaching-field requirements are somewhat less than those of a major field. They are determined in conference with an adviser. Students preparing to teach on the elementary level are advised to use free electives to increase their mastery of content in an academic field or an area of specialization, e.g.—Physical Education, etc.

The prescribed course in special methods is concerned primarily with methods of initiating, guiding, and evaluating learning experiences dealing with the content of the teaching field. It attempts to bring to the student specific suggestions drawn from the accumulated experience of successful teachers. However, in addition, the course reviews the teaching-field content currently in use in schools and the examination at the end of the course provides the final test of competency in the teaching field.

Those preparing to teach on the secondary level may be required to complete the prescribed courses in a minor as well as a major field. Students preparing to teach on the elementary level are advised to use free electives to increase their mastery of content in an academic field or area of specialization.

Prescribed Courses in the Various Teaching Fields

ART

Six semester hours from the following.....	
Art 1: Art Appreciation	
Art 31-32: Survey of Art	
Art 71-72: Introduction to the Arts in America	
Art 101: Ancient Art	
Art 102: Medieval Art	
Art 109: Nineteenth Century Art in Europe	
Art 110: Contemporary Art	
Art 205: Baroque Art in Italy	
Six semester hours from the following.....	
Art 105: Renaissance Art in Italy	
Art 106: Renaissance Art in the North	
Art 203: Primitive Art	
Art 204: Art of the Far East	
Art 210: Christian Iconography	
Twenty-four semester hours from the following.....	
Art 21-22: Basic Design	
Art 45-46: Drawing and Painting I—Life and Still Life	
Art 65-66: Drawing and Painting I—Life, Still Life, and Portrait	
Art 67-68: Drawing and Painting I—Life and Portrait	
Art 81-82: Sculpture I	
Art 125-26: Drawing and Painting II—Life, Still Life, and Portrait	
Art 127-28: Drawing and Painting II—Life and Portrait	
Art 165-66: Drawing and Painting II—Life and Portrait	
Art 179-80: Sculpture II	
Art 183-84: Commercial Art	

Total.....

Semester
Hours
6

6

24

36

BIOLOGY

Biology 1-2: Survey in Biology.....	
Biology 127: Genetics	
Botany: (Advanced courses as approved by the adviser).....	
Chemistry 11-12: General Chemistry.....	
Physiology: (As approved by the adviser).....	
Physics 11, 12: Introductory Physics.....	
Zoology 41-42: Comparative Vertebrate Anatomy.....	
Zoology 101-2: Invertebrate Zoology	

Total.....

6

3

2

8

4

6

6

6

45

BUSINESS EDUCATION

	Semester Hours
Accounting 1: Introductory Accounting.....	3
Economics 1-2: Principles of Economics.....	6
Secretarial Studies 51: Business Correspondence.....	3
Additional courses, as prescribed, in one of the following groups:	
Group 1—Secretarial Studies*	
Secretarial Studies 2: Intermediate Typewriting.....	3
Secretarial Studies 12: Intermediate Shorthand and Transcription	3
Secretarial Studies 15: Advanced Shorthand, Typewriting, and	
Transcription.....	3
Secretarial Studies 16: Secretarial Shorthand, Typewriting, and	
Transcription.....	3
Secretarial Studies 54: Secretarial Practice.....	3
†Additional courses from the following, as approved by the adviser	
Accounting 2: Introductory Accounting	6
Business Administration 101: Business Organization and Com-	
bination	
Business Administration 109: Office Management	
Business Administration 141: Principles of Marketing	
Business Administration 151: Retail Store Management	
Business Administration 161: Commercial Law: Contracts,	
Sales, Agency, and Bailments	
Economics 121: Money and Banking	
Statistics 52: Mathematics of Finance	
Total.....	33
Group 2—Bookkeeping, Business Arithmetic, and Business Law	
Accounting 2: Introductory Accounting.....	3
Business Administration 101: Business Organization and Combi-	
nation.....	3
Business Administration 102: Business Management.....	3
Business Administration 161: Commercial Law: Contracts, Sales,	
Agency, and Bailments.....	3
Business Administration 162: Commercial Law: Negotiable In-	
struments, Property, Mortgages.....	3
Statistics 52: Mathematics of Finance.....	3
†Six semester hours from the following, as approved by the adviser	
Accounting 111: Financial Statement Analysis	6
Business Administration 121: General Insurance	
Business Administration 131: Business Finance	
Business Administration 138: Investments	
Economics 121: Money and Banking	
Total.....	36
Group 3—Distributive Education	
Business Administration 141: Principles of Marketing.....	3
Business Administration 142: Marketing Management Problems.	3
Business Administration 145: Sales Management.....	3
Business Administration 151: Retail Store Management.....	3

* Candidates inadequately prepared for Secretarial Studies 2 or 12 may be required to take Secretarial Studies 7 or 11.

† Not required for the minor teaching field.

*Twelve semester hours from the following, as approved by the adviser		Semester Hours
Business Administration 147:	Advertising	12
Business Administration 150:	Procurement and Materials Management	
Business Administration 158:	Traffic Management	
Business Administration 175:	Introduction to Foreign Trade	
Business Administration 176:	Exporting and Importing	
Total.....		36

CHEMISTRY

Chemistry 11-12:	General Chemistry	8
Chemistry 21:	Qualitative Inorganic Analysis	4
Chemistry 22:	Quantitative Inorganic Analysis I	4
Chemistry 151-52:	Organic Chemistry	8
Chemistry 191:	History of Chemistry	2
Mathematics 3:	College Algebra	3
Mathematics 6:	Plane Trigonometry	3
Mathematics 12:	Analytic Geometry	3
Physics 11, 12, 13:	Introductory Physics	9
Total.....		44

ELEMENTARY EDUCATION

Education 113:	Elementary School Art	3
Education 114:	Elementary School Music	3
Geography 51, 52:	Introduction to Geography, World Regions	6
History 71-72:	Development of the Civilization of the United States	6
Mathematics 2:	General Mathematics	3
Physical Education 101:	Physical Education in Elementary School	6-8
Science, as approved by adviser		6
Six semester hours from the following, as approved by the adviser		
Economics 1-2:	Principles of Economics	
History 39-40:	Development of European Civilization	
Political Science 9-10:	Government of the United States	
Religion 59-60:	History of Religion	
Sociology and Anthropology 1-2:	Man in Modern Society	
Total.....		36-38

ENGLISH

English 1, 2:	English Composition	6
English 52:	Introduction to English Literature	3
English 71-72:	Introduction to American Literature	6
English 125:	Introduction to English Linguistics	3
English 135-36:	Shakespeare	6
Speech 11:	Voice and Diction	3

* Not required for the minor teaching field.

*Nine semester hours from the following, as approved by the adviser...

Semester
Hours
9

- English 151-52: The Romantic Movement
English 161-62: Victorian Literature
English 165-66: The Twentieth Century
English 170: The American Short Story
English 171-72: Studies in American Literature
English 173-74: Major American Poets
English 176: American Drama
English 177-78: American Fiction
English 182: The English Novel
English 183-84: The English Drama

Total..... 36

FRENCH

- French 1-2: First-year French 6
French 3-4: Second-year French 6
French 9-10: French Conversation and Composition..... 6
French 51-52: Survey of French Literature and Civilization..... 6
*Additional courses in French, as approved by the adviser..... 12

Total..... 36

GENERAL SCIENCE†

- Chemistry 11-12: General Chemistry 8
Chemistry 21: Qualitative Inorganic Analysis..... 4
Physics 11, 12, 13: Introductory Physics..... 9
Physics 16: General Physics..... 3
Nine semester hours from the following..... 9
Mathematics 3: College Algebra
Mathematics 6: Plane Trigonometry
Mathematics 12: Analytic Geometry
Mathematics 29, 30, 31: Calculus I, II, III
One of the following..... 6-8
Biology 1-2: Survey in Biology
Botany 1-2: General Botany
Zoology 1-2: Introduction to Zoology

Total..... 39-41

GEOGRAPHY

- Geography 51: Introduction to Geography..... 3
Geography 52: World Regions..... 3
Geography 103-4: Cartography 6
Geography 115-16: Physical Geography..... 6
Geography 141-42: Urban Settlement..... 6
Six semester hours from the following..... 6
Geography 183: Western Europe
Geography 184: The Mediterranean
Geography 191: Latin America

* Not required for the minor teaching field.
† May not be chosen as a minor field.

Geography 195:	Eastern and Southeastern Asia	
Geography 197:	The Pacific	
Geography 198:	Australia	
*Six semester hours	from the following.....	6
Geography 125:	Transportation Complexes	
Geography 126:	World Food Supply	
Geography 133:	Regional Industrial Structures	
Geography 134:	Location of Industry	
Geography 145:	World Cultural Geography	
Geography 146:	World Political Geography	

Total..... 36

GERMAN

German 1-2:	First-year German.....	6
German 3-4:	Second-year German.....	6
German 9-10:	German Conversation and Composition.....	6
German 51-52:	Introduction to German Literature.....	12
*Additional courses	in German, as approved by the adviser.....	36

Total.....

HISTORY

History 39-40:	The Development of European Civilization.....	6
History 71-72:	The Development of the Civilization of the United States	6
Six semester hours	from each of the following groups, as approved by the adviser	18
Group 1—American History		
History 171-72:	Social History of the United States	
History 173:	Representative Americans	
History 174:	Economic History of the United States	
History 181-82:	Diplomatic History of the United States	
Group 2—European History		
History 109:	Intellectual History of the Western World I: the Classical World	
History 110:	Intellectual History of the Western World II: The Middle Ages and Renaissance	
History 130:	Nationalism	
History 143-44:	History of Old Russia	
History 147:	Economic History of Europe	
History 149-50:	European Diplomatic History	
History 151-52:	English History	
*Group 3—Latin American History		
History 163:	Colonial Latin America	
History 164:	South America since Independence	
History 166:	Mexico and the Caribbean since Independence	
Political Science 177:	Recent Trends in Latin American Politics and Government	

* Not required for the minor.

Political Science 178: International Politics in the Western Hemisphere	Semester Hours
*Additional semester hours from one of the foregoing groups, as approved by the adviser.....	6
Total.....	36

HOME ECONOMICS

Home Economics 1: Food Selection and Preparation.....	Semester Hours
Home Economics 22: Clothing: Its Selection, Cost, and Care.....	3
Home Economics 51: Family Meals.....	3
Home Economics 53: Family Health and Household Sanitation.....	3
Home Economics 62: Clothing Construction.....	3
Home Economics 102: Advanced Food Preparation.....	3
Home Economics 123: Household Finance and Problems of the Consumer.....	3
Home Economics 143: Advanced Clothing Construction.....	3
Home Economics 152: Nutrition.....	3
Home Economics 171: House Furnishing.....	3
Home Economics 181: The Child in the Home.....	3
Home Economics 192: The Home, Its Management and Equipment..	3
Physiology 115: Physiology.....	3
Total.....	39

MATHEMATICS

Mathematics 3: College Algebra.....	3
Mathematics 6: Plane Trigonometry.....	3
Mathematics 12: Analytic Geometry.....	3
Mathematics 29, 30, 31: Calculus I, II, III.....	9
Mathematics 101: Introduction to Mathematical Logic.....	3
Mathematics 123: Theory of Equations, or	
Mathematics 125: Advanced Algebra.....	3
Mathematics 132: Differential Equations, or	
Mathematics 139: Advanced Calculus.....	3
*An additional course in Mathematics, as approved by the adviser....	3
Total.....	30

PHYSICAL EDUCATION†

Biology 1-2: Survey in Biology or	
Zoology 1-2: Introduction to Zoology.....	6-8
Physiology (as approved by the adviser).....	3
Physical Education 43-44: Techniques of Physical Education Motor Activities.....	4
Physical Education 49: Human Anatomy.....	3

* Not required for the minor teaching field.
† May be chosen as a minor field only.

	Semester Hours
Physical Education 50: Kinesiology	3
Physical Education 51-52‡ (women): Methods and Materials for Teaching Physical Education Activities or Sports in Secondary Schools.....	4
Physical Education 115-16‡ (men): Methods and Materials for Team Sports in Secondary Schools.....	1
Physical Education 107: Techniques for Teaching Recreational Dance	
Physical Education 113-14§: Methods and Practice in Teaching Physical Educational Activities.....	4
Physical Education 117‡ (women): Methods for Teaching Modern Dance	1
Physical Education 122: Methods and Materials of Health Education	3
Physical Education 138‡: Organization and Administration of Physical Education.....	3
Total.....	27-32

PHYSICS

Physics 11: Introductory Physics.....	3
Physics 14, 15, and 16: General Physics.....	9
Physics 55: Physical Measurements.....	3
Physics 101: Mechanics	3
Physics 105: Principles of Electricity.....	3
Physics 106: Optics	3
*Chemistry Elective—Chemistry 11-12: General Chemistry or Chemistry 12 and 21: General Chemistry and Qualitative Inorganic Analysis	8
Mathematics 12: Analytic Geometry.....	3
Mathematics 29, 30, 31: Calculus I, II, III.....	6
*Six semester hours from the following.....	
Physics 102: Heat and Thermodynamics	
Physics 113: Atomic Physics	
Physics 114: Statistical Physics	
Physics 128: Sound	
Physics 132: Electronics	
Physics 155: Advanced Laboratory in Electricity and Magnetism	
Physics 156: Advanced Laboratory in Optics	
Total.....	50

RUSSIAN*

Russian 1-2: First-year Russian.....	6
Russian 3-4: Second-year Russian.....	6
Russian 9-10: Russian Conversation.....	6
Russian 101-2: Rapid Readings in Russian.....	6
Total.....	24

* May be chosen as a minor teaching field only.

‡ Required only of those preparing to teach on the secondary school level.

§ Required only of those preparing to teach on the elementary school level.

SOCIAL STUDIES

	Semester Hours
History 39-40: The Development of European Civilization.....	6
History 71-72: The Development of the Civilization of the United States	6
Political Science 9-10: Government of the United States.....	6
Twelve semester hours from the following.....	12
Economics 1-2: Principles of Economics	
Geography 51, 52: Introduction to Geography; World Regions	
Religion 59-60: History of Religion	
Sociology and Anthropology 1-2: Man in Modern Society	
*Additional second-group courses, as approved by the adviser, from one of the following fields: Economics, Geography, History, Political Science, Religion, Sociology and Anthropology.....	12
Total.....	42

SPANISH

Spanish 1-2: First-year Spanish.....	6
Spanish 3-4: Second-year Spanish.....	6
Spanish 9-10: Spanish Conversation and Composition.....	6
*Additional courses, as approved by the adviser.....	18
Total.....	36

SPEECH

Speech 1: Effective Speaking.....	3
Speech 2: Persuasive Speaking.....	3
Speech 11: Voice and Diction.....	3
Speech 32: Oral Reading.....	3
Speech 101: Voice and Phonetics.....	3
Speech 121: Group Discussion and Conference Leadership.....	3
Speech 153: Acting	3
Speech 175: Speech Correction.....	3
One of the following areas of specialization, as approved by the adviser:	
*Group 1—Speech Arts	
Twelve semester hours from the following.....	12
Speech 102: Oral Interpretation of Literature	
Speech 126: Public Discussion and Debate	
Speech 154: Play Production	
Speech 166: History of the Theater	
Speech 169: Creative Dramatics and Children's Theater	
*Group 2—Speech Correction	
Twelve semester hours from the following.....	12
Speech 176: Speech Correction	
Speech 177-78: Clinical Practice in Speech Therapy	
Speech 182: Hearing Problems and the Testing of Hearing	
Speech 183-84: Clinical Practice in Hearing Therapy	

*Not required for the minor.

Speech 191: Proseminar: Speech Correction
Additional courses in English, Physiology, Psychology, or
Speech, as approved by the adviser

Total.....

Semester
Hours

36

Professional Education

The basic professional information, skills, and attitudes needed by beginning teachers are provided through a sequence of courses to be taken in the junior and senior years. Lectures and class discussions are closely coordinated with field work. Instruction is differentiated to meet the needs of those preparing to teach on the various levels—elementary school, junior high school, senior high school, and adult.

PROFESSIONAL COURSES—SECONDARY

Education 109-10: Human Development, Learning, and Teaching...
Education 121-22: Society and the School.....
Education 131: Common Teaching Skills in Secondary Schools...
Education 133-34: Observation and Student Teaching in Secondary
Schools

Three to six semester hours from the following Special Methods courses

Education 136: Teaching English
Education 138: Teaching Social Studies
Education 140: Teaching Mathematics
Education 144: Teaching Science
Education 146: Teaching Foreign Languages
Education 148: Teaching Home Economics
Education 150: Teaching Business Subjects

Total.....

Semester
Hours

6

6

3

6-9

3-6

24-30

PROFESSIONAL COURSES—ELEMENTARY

Education 109-10: Human Development, Learning, and Teaching...
Education 111: Methods in Elementary Education.....
Education 112: Guidance in Elementary Schools.....
Education 121-22: Society and the School.....
Education 135: Student Teaching in Elementary Schools.....

Total.....

6

6-12

3

6

9

36

Human Development, Learning, and Teaching.—Students enrolled in the four-year programs leading to the degree of Bachelor of Arts take this course in the junior year. Those enrolled in five-year programs take it in the senior year.

This course attempts to promote a functional understanding of (1) the

nature of human growth, development, and learning, illustrated by observation of children in learning situations; (2) the nature of teaching based on principles of human growth, development, and learning, illustrated by observation of school situations. At least an equal amount of time is spent in observation and study of the application of these characteristics and principles to classroom situations. Class discussion normally revolves around these field experiences.

The course is also intended to provide the student with exploratory experiences of assistance to him in deciding whether to choose the profession of teaching. The student's performance in connection with the course is one of the factors considered when the Faculty reviews the list of candidates who have completed the first semester of the junior year (senior year for those enrolled in five-year programs).

Society and the School.—This course is also taken in the junior year by candidates enrolled in four-year programs (senior year by those in five-year programs).

The first half of the course attempts to promote an understanding and appreciation of the role of schools in the sound promotion of the enduring interests of our democratic society. More particularly, it attempts to develop a functional understanding of the contributions of all social agencies in the education of people and of desirable cooperative working relations that help the school to play its part as a member of the institutional "team" of the community.

The second half of the course is concerned with study of the school as a whole—its purposes, program of studies, out-of-class activities, general organization, and major instructional problems. Although schools at all levels are studied, students give particular attention to schools at the level within which they are preparing to teach.

Classes meet for lecture and discussion for one two-hour meeting each week. At least an equal amount of time is spent in field study. During the first half each student studies cooperating social institutions. In the second half extended study of schools at the level of the student's special interest is supplemented by briefer studies of schools at other levels. Class discussion is largely determined by field experiences.

This course is also intended to provide the student with exploratory experiences of guidance value. The performance of the student in the first half of the course is also given careful consideration by the Faculty in its review of the list of candidates at the beginning of the second semester of the junior year (senior year for those enrolled in five-year programs).

Common Teaching Skills in Secondary Schools.—Those enrolled in four-year programs take this course in the senior year. Those enrolled in five-year programs take it in the fifth year. The course is concerned with the skills needed by teachers in connec-

tion with classroom management, teaching techniques, homeroom procedures, administrative routines, activity sponsorship, group planning, and public relations.

Classes meet for one and one-half hours twice a week for lecture, discussion, and laboratory. The observation of classroom teaching done in connection with the Observation Course (Education 133), for which students are normally enrolled concurrently, provides the field work of the course.

Special Methods Courses in Secondary Schools.—Associated with each teaching field is a course dealing with its special teaching problems. In addition to the study of practices followed by successful teachers, actual teaching content as found in current texts and courses of study is reviewed. Needed content, not included in academic courses available for teaching-field preparation, is taught in these courses.

Observation and Student Teaching in Secondary Schools.—This course is taken in the senior year by students enrolled in four-year programs (in the fifth year by those in five-year programs).

It begins with the observation of classroom teaching in selected situations. Assumption of responsibility for teaching functions is gradual, leading eventually to practice in the complete direction of classroom activities. Those preparing to teach in secondary schools have the opportunity of observing and doing practice teaching in both major and minor teaching fields on the senior high school level. The course is directed by full-time members of the faculty of the School of Education. The work of each student is under the direct supervision of a critic teacher, selected because of unusual success in teaching, ability to supervise, and broad understanding of educational problems. Critic teachers are part-time members of the instructional staff of the School. Observation and student teaching are done in the public schools of the metropolitan area of Washington, assuring practice in situations comparable to those the student is likely to face on becoming a teacher.

Methods in Elementary Education.—Those enrolled in four-year programs take this course in the fall semester of the senior year. Those enrolled in five-year programs take it in the fall semester of the fifth year.

The course offers an integrated approach to general and special methods of instruction in elementary schools. It includes discussion of general skills needed in classroom management, administrative duties, group planning, and public relations. Special techniques of instruction include those needed in teaching arithmetic; science; social studies; and the language arts (reading, literature for children, oral and written expression, spelling, and handwriting). The planning of units of work and the evaluation of pupil progress are also discussed.

Students are required to devote each morning to the prescribed activities of this course. Three mornings a week (9:00–12:00 A.M.) are normally

devoted to lectures and discussions by three staff members of the Department of Education. Two mornings a week are spent in observation of and participation in classroom instruction in cooperating public schools of the Metropolitan Area.

Guidance in Elementary Schools.—Those enrolled in four-year elementary school programs usually take this course in the senior year. Those enrolled in five-year programs take it in the fifth year.

The course is concerned with the guidance services provided by teachers and counselors for elementary school students. It includes discussion of ways of discovering and appraising student needs, the selection of pertinent tests, the construction of teacher-made objective and essay-type tests, and the interpretation of test results.

The course meets for two hours once a week for classroom instruction. Out-of-class assignments include practice in the construction, administration, and scoring of tests.

Student Teaching in Elementary Schools.—This course is taken in the senior year by students enrolled in four-year programs and in the fifth year by those enrolled in five-year programs.

Students who have not had previous teaching experience are normally assigned to student teaching for a period of twelve weeks. At the request of the student, this assignment may be divided between two different grade levels. An attempt is made to arrange a student-teaching placement in a school system within the Metropolitan Area of Washington and at the grade levels most appropriate in view of ultimate employment aims. Guidance is provided as the student learns to assume responsibility for the major teaching activities.

Students are not asked to take complete charge of a class at the beginning of the student-teaching period. Assumption of full responsibility for teaching activities is gradual and is preceded by an initial period of guided participation and instruction. Toward the end of his assignment the student teacher takes full charge of the class for a considerable period.

Each student is supervised by a member of the Faculty of the School of Education. A cooperating teacher, chosen for proven teaching ability and the capacity to carry on a satisfactory supervisory relationship, is in direct charge of the student-teaching experience.

Special Curricula in Elementary Education

Students preparing for elementary school teaching may also qualify as teachers of French, Spanish, remedial speech, and physical education. Programs should be planned in conference with an adviser.

ATTITUDES NEEDED FOR SUCCESS IN TEACHING

The development of attitudes that motivate professional behavior consistent with the nature of the learning-teaching process is basic to success

in teaching. Among the most important of these attitudes are: appreciation of the role of learning in human improvement, respect for intellectual proficiency and true scholarship, objective thinking, and a sense of mission as a member of an important profession.

The responsibility for developing and strengthening attitudes favorable to success in teaching is shared by all parts of the program of teacher education. General education provides a foundation of information essential to an understanding of the course of human events, skills that promote effective social intercourse, the bases of perspective, and an appreciation of cultural development. Teaching-field preparation stimulates intellectual curiosity and respect for objective scholarship in contrast to rationalization. Professional education is organized in a sequence of learning activities primarily based upon the results of research concerning the ways in which the learner grows and develops.

To help students understand the role of education in society and human development and, thus, strengthen a sense of mission and pride in becoming members of the teaching profession, professional courses are closely related to field experiences, and students are encouraged to discuss freely varying viewpoints concerning goals and the interpretation of research data.

Since individual needs in the development of attitudes vary widely, students are encouraged to confer frequently with staff members. Conference hours are designated for this purpose.

FIVE-YEAR PROGRAMS LEADING TO THE DEGREES OF BACHELOR OF ARTS AND MASTER OF ARTS IN EDUCATION

Five-year programs are designed: to permit more adequate teaching-field and professional preparation, to prepare for special teaching positions, and to meet teaching-certificate requirements based upon five years of preparation.

Students in these programs usually devote the junior year to additional teaching-field preparation and general education. Ordinarily, teaching-field preparation is continued in the senior year and the first two professional courses (Education 109-10, 121-22) are taken. The work of the fifth year includes the remaining undergraduate professional courses and the balance of graduate courses needed to meet the requirements of the degree of Master of Arts.

Candidates must have a quality-point index of at least 2.50 before beginning the work of the senior year. As much as 18 semester hours of the work of the senior year may be taken for graduate credit. Observation and Student Teaching in Secondary Schools, and Student Teaching in Elementary Schools taken in the fifth year, may not be taken for graduate credit.

Candidates enrolled in five-year programs on the secondary school level are able to prepare more adequately in their major or minor teaching fields, or in both. Additional teaching-field courses must be approved by the adviser in the teaching field concerned.

The five-year plan of study also provides an opportunity for candidates to prepare to teach "common learnings" courses in one or more of the various core curriculum plans now found in many secondary schools. Such programs need to be carefully planned to meet the demands of the situation in which the candidate hopes to teach.

A number of cities and some states require five years of satisfactory preparation before issuing certain teaching certificates. Candidates seeking such certificates should familiarize themselves with the requirements of the community or state concerned and plan their programs accordingly.

Candidates enrolled in five-year programs on the elementary school level are able, in addition to preparation as regular classroom teachers, to prepare for special positions such as: teacher of a foreign language, specialist in remedial speech, specialist in remedial reading, and itinerant teacher of Physical Education.

Five-year programs must meet all the requirements of the degrees of Bachelor of Arts and Master of Arts in Education, and must be approved by the adviser designated for these programs.

THE DEGREE OF MASTER OF ARTS IN EDUCATION

Programs of study leading to the degree of Master of Arts in Education are designed to enable teachers of experience to increase their knowledge of professional and academic information and skills, prepare for special types of educational service, and provide opportunities for graduates of liberal arts colleges to acquire needed professional education.

Programs are planned in conference with the designated Adviser and take into consideration the interests of the candidate, his previous background, and the certification requirements of the state and locality in which he plans to teach.

PLANS OF STUDY

Two general plans of study lead to the degree.

Plan 1.—This plan requires a minimum of 30 hours of graduate credit, including a thesis carrying 6 hours of graduate credit.

Plan 2.—This plan requires a minimum of 33 hours of graduate credit, including a course in *Educational Research Methods and Procedures* carrying 3 hours of graduate credit.

Under Plan 1, a minimum of 12 semester hours, in addition to the thesis, must be from courses planned primarily for graduate students (third-group courses). Under Plan 2, a minimum of 18 semester hours, in addition to the course in *Educational Research Methods and Procedures*, must be from third-group courses. Under either plan a minimum of 12 semester hours, not including the thesis or the research course, must be from courses offered in the Department of Education.

Programs may provide for additional academic preparation in one or more teaching fields. In such cases, however, undergraduate and graduate courses combined must be at least equivalent to the undergraduate requirements for the degree of Bachelor of Arts in Education in the teaching field concerned.

Programs are normally based upon undergraduate preparation equivalent to the requirements for the degree of Bachelor of Arts in Education (see pages 14-30). Candidates with less preparation must make up their deficiencies either prerequisite to or as part of their graduate study.

Each candidate must file in the Office of the Dean not later than one month after admission to the School of Education a program of study approved by his adviser.

THE THESIS

The thesis required under *Plan 1*, must conform to standards prescribed. A statement of these standards may be obtained at the Office of the Dean.

The thesis subject must be approved in writing by the candidate's adviser and recorded in the Office of the Registrar by the date announced in the University calendar. The thesis in its final form must be presented to the Dean by the candidate no later than the date announced in the calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see page 52) are available in the Office of the Dean.

Payment of tuition for the thesis will entitle the candidate, during the academic year of registration, to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period it must be registered for again and tuition paid on the same basis as for a repeated course.

COMPREHENSIVE EXAMINATION

In addition to the course examinations, the candidate must pass a comprehensive examination in two parts: (1) a general three-hour examination concerned with an integrated understanding of the major areas

in professional education, and (2) a special three-hour examination concerned with the candidate's area of specialization.

PROGRAMS OF STUDY

Secondary Education—Senior or Junior High School

Students interested in secondary school teaching whose undergraduate degrees are in professional education are encouraged to strengthen their teaching-field preparation by including in their programs of study content courses.

Programs include, in addition to teaching-field courses, 6 semester hours in Secondary Education, and, ordinarily, an additional 12 semester hours of work chosen from the following professional courses: Audio-visual Education; Adolescent Growth and Development; Comparative Education; Curriculum; Educational Measurement; Evaluation in Education; Extra-classroom Activities; Group Procedures in Education; Guidance in Secondary Schools; History of Education; Human Development, Learning, and Teaching; Philosophy of Education; Secondary School Classroom Procedures; School and Community; and a special methods course in the candidate's teaching field.

School Administration—Secondary School Principalship or Elementary School Principalship

Programs in administration include The Teacher and School Administration, The Teacher and School Supervision, and either Secondary School Management or Administration of Elementary Education. Additional courses are chosen as needed from Adult Education, Curriculum, Basic Issues in Elementary Education, Guidance in Secondary Schools, Public Relations in School Administration, School Finance, School Law, Planning the School Plant, and Secondary Education.

Adult Education

Programs in the education of adults may include additional teaching-field preparation. In addition to 6 semester hours in Adult Education, professional courses may be chosen from Audio-visual Education; Curriculum; Educational Measurement; Employee Training; Evaluation in Education; Group Procedures in Education; Guidance in Secondary Schools; History of Education; Human Development, Learning, and Teaching; Mental Hygiene; and Philosophy of Education.

Elementary Education

Programs customarily include Basic Issues in Elementary Education and Instructional Areas in Elementary Education, with additional courses chosen from Audio-visual Education; Child Growth and Development;

Children's Literature; Comparative Education; Curriculum; Educational Measurement; Education of Exceptional Children; Education of Slow-learning Children; Education of the Gifted; Elementary School Classroom Procedures; Evaluation in Education; Group Procedures in Education; History of Education; Human Development, Learning, and Teaching; Mental Hygiene; Philosophy of Education; Reading Problems; and Speech Correction.

Comparative Education

Programs in Comparative Education usually include 18 semester hours in Comparative Education, History of Education, and Philosophy of Education, with additional courses chosen from Adult Education, Basic Issues in Elementary Education, Curriculum, and Secondary Education.

Curriculum

Programs in curriculum development include 9 semester hours in Curriculum, with additional courses chosen from Adolescent Growth and Development; Adult Education; Audio-visual Education; Basic Issues in Elementary Education; Child Growth and Development; Educational Measurement; Evaluation in Education; Extra-classroom Activities; Group Procedures in Education; History of Education; Human Development, Learning, and Teaching; Philosophy of Education; School and Community; and Secondary Education.

Employee Training

Programs in the training of employees in business, industry, and government normally include 12 semester hours in Employee Training and Adult Education. Additional courses are chosen from Audio-visual Education, Curriculum, Educational Measurement, Evaluation in Education, Guidance in Secondary Schools, Mental Hygiene, Personnel Psychology, Philosophy of Education, Public Relations in School Administration, Teacher and School Supervision, and Techniques of Counseling.

Guidance

Programs in Guidance usually include such courses as Counseling and Guidance, Techniques of Counseling, Guidance in Secondary Schools, Occupational and Educational Information, Mental Hygiene, and Analysis of the Individual for Purposes of Counseling. Additional courses are often chosen from among the following: Adult Education, Curriculum, Employee Training, Evaluation in Education, Group Procedures in Education, Individual Psychological Testing, Philosophy of Education, Psychological Tests, Secondary Education, and Test Construction.

History of Education

Programs in the history of education include 12 semester hours in History of Education and Philosophy of Education with additional courses from among the following: Adult Education, Basic Issues in Elementary Education, Comparative Education, Curriculum, School and Community, and Secondary Education.

Philosophy of Education

Programs in the Philosophy of Education include 12 semester hours in Philosophy of Education and History of Education with additional courses chosen from Adult Education, Basic Issues in Elementary Education, Curriculum, School and Community, and Secondary Education.

Reading

Programs in developmental and remedial reading include courses in Reading Problems and the Clinical Study of Reading Problems. Additional courses are chosen from Child Growth and Development, Curriculum, Education of Exceptional Children, Education of Slow-learning Children, and Philosophy of Education.

Teacher Education

Programs in teacher education include 6 semester hours in this field, with additional courses chosen from Adolescent Growth and Development, Child Growth and Development, Curriculum, History of Education, Philosophy of Education, and Secondary Education.

THE ADVANCED PROFESSIONAL CERTIFICATE

Upon the satisfactory completion of the program of advanced graduate studies of the School of Education, the Advanced Professional Certificate is granted. This program is designed to prepare teachers and administrators for more effective service in their chosen fields and to enable them to qualify for a higher step in the local salary scale.

The program of studies leading to the certificate is selected by the candidate and his adviser from the various related departments of the University in accordance with the student's needs. He is encouraged to include in his program study at other accredited higher institutions when such study seems to be in his best interest. In general it includes thirty hours of graduate credit beyond the Master's degree. The candidate wishing to increase his teaching proficiency may include additional study in his teaching field.

REQUIREMENTS FOR THE CERTIFICATE

Plans of Study

In planning his program of studies the candidate should give first consideration to his particular needs. If he is a teacher and his graduate study leading to the Master's degree was largely in professional education, he may find it desirable to emphasize additional mastery of his teaching field. If his Master's preparation was in a content field, he may wish to devote a major part of his program to additional professional study. Those in administration and related services may wish to continue specialization on a more advanced level.

The program of study must include, in addition to any prerequisites, a minimum of 30 hours of graduate credit, 24 hours of which must be in third-group courses (or the equivalent at other institutions). Not more than 6 semester hours of graduate credit in second-group courses may be included in the minimum program and not less than 12 semester hours must be in courses offered by the Department of Education.

RESIDENCE

Candidates for the Advanced Professional Certificate must complete satisfactorily at this University a minimum of 18 semester hours in courses offered on the campus. The balance of the program may be in the College of General Studies off-campus courses or in other approved institutions of higher learning. The candidate is not required to pursue his program of study continuously. On request, a leave of absence is granted for a period not to exceed three years.

THE DEGREE OF DOCTOR OF EDUCATION

The requirements for the degree of Doctor of Education cannot be stated in semester hours, but they consist in general of at least two full years of work beyond the degree of Master of Arts in Education or the equivalent. The programs of study are designed to prepare students for administrative or supervisory positions, the teaching of education in schools or colleges, or departments of education the teaching of an academic subject in schools or colleges, or for specialized types of educational service. The work is given a practical rather than a theoretical bent, and emphasizes the mastery and application of subject matter, both in the study requirements and in the dissertation. Special emphasis is placed upon the professional success of the candidate.

The candidate's program of study depends for the most part upon his previous educational background and his professional objective. Opportunities are provided for study leading to the following professional

objectives: school superintendent, secondary school principal, elementary school principal, supervisor, director of guidance, director of curriculum development, professor of education, and specialist in educational research.

QUALIFICATIONS OF THE APPLICANT

The candidate for the degree of Doctor of Education must have completed (1) graduate work in fields prerequisite to his objective, equivalent to that required for the degree of Master of Arts in Education in The George Washington University, and (2) at least three years of successful educational experience pertinent to his professional objective.

ADMISSION TO CANDIDACY

To be admitted to candidacy for the degree the applicant must be accepted by the Committee on Graduate Studies on the basis of the following factors: (1) his previous scholastic record, (2) his professional success, (3) the outcomes of a series of personal conferences with staff members, (4) a scholastic-aptitude test, (5) an essay-type examination, and (6) an oral examination.

CONSULTATIVE COMMITTEE

If the applicant is accepted as a candidate, the Committee on Graduate Studies and his major adviser in cooperation with the candidate, will (1) determine the fields of study, in each of which the candidate must pass a written examination at least eight months before he presents himself for the degree; (2) formulate a list of courses and of readings that will assist him in preparing for these examinations; and (3) designate the tools of investigation that will be needed by the candidate in the prosecution of his study. These tools may include one foreign language or more, statistical methods, historical criticism, or any others considered essential by the committee. An examination in the tools designated must be passed by the candidate before he takes his final comprehensive examination.

THE DISSERTATION

When the candidate has satisfied the requirements of his program of studies, his progress will be reported by his major adviser to the Committee on Graduate Studies. If such progress is approved a member of the Faculty, in whose field the topic of the dissertation falls, is then appointed to serve as the candidate's adviser on his dissertation, and to recommend him to the Dean for the final oral examination when, in his judgment, the candidate's dissertation is acceptable.

No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation

together with a fourth (original) copy of the summary. Printed copies of detailed regulations regarding the form and reproduction of the dissertation and its summary (see page 52) are available in the Office of the Dean. The summaries of accepted dissertations will be printed in a numbered issue of the *University BULLETIN*. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of the dissertation.

THE FINAL EXAMINATION

At least three weeks before the degree is to be conferred the candidate must pass an oral examination on his dissertation and on his field of specialization before a committee of the Faculty appointed by the Dean, supplemented by two experts from outside the University. This examination is open to the public and all are privileged to question the candidate. The Dean, or a member of the Faculty designated by him will preside at this examination.

READING CLINIC

To help children and adults with reading difficulties the University operates a diagnostic and corrective reading clinic. Children may be referred by principals, teachers, or parents. Adults may apply by telephone.

To arrange for a clinical examination of reading status, address The George Washington University Reading Clinic, 2018 I Street, NW., or telephone FEderal 8-0250, Extension 491, for an appointment. The Clinic is open for appointments Monday through Friday, from 9:00 A.M. to 5:00 P.M.

Fees.—The fee for individual diagnosis is \$35; for individual instruction, \$4.50 a lesson; for semi-individual instruction, \$3.50 a lesson; for instruction in small groups with common reading difficulties, \$2.75 a lesson; for materials, \$4. All fees are payable in advance at the Office of the Cashier.

SPECIAL CURRICULA

The School of Education provides special curricula for liberal arts graduates, housewives, and retired military personnel who wish to prepare for teaching. It also provides a wide range of courses of interest to (1) emergency teachers who wish to qualify for teaching certificates and (2) teachers who wish to renew licenses.

REGULATIONS

ADMISSION

An applicant for admission must obtain from the Office of the Director of Admissions an application blank which he must fill out completely and return with the application fee of \$10 if applying as a degree candidate, \$5 if applying as a nondegree candidate.

Two recent photographs with signature of the applicant must accompany the blank.

Applications should be filed by July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions.

ENTRANCE REQUIREMENTS

For the Bachelor's Degrees

Bachelor of Arts in Education, Bachelor of Science in Home Economics, Bachelor of Science in Physical Education.—An Associate in Arts degree based on the *Education, Home Economics, or Physical Education* curricula in the Junior College (see pages 10-11, 13, 14-16), or the equivalent from another accredited higher institution, or a certificate of graduation from an approved normal school or the equivalent is required. The applicant must have a quality-point index of 2.00 (average grade of C) counting *Incomplete* grades as F. He must have demonstrated a genuine interest in teaching, possess personality traits that give promise of success as a teacher.

Applicants in the Metropolitan Washington Area must have a personal conference with the Assistant Dean of the School of Education in charge of admission or with one of his assistants. Applicants from a distance who are strongly recommended as good teacher prospects by a member of the Faculty of another institution may be admitted without a personal conference.

Applicants who have graduated from the Junior College or have attained equivalent standing at other accredited institutions, but have not completed satisfactorily all of the courses included in the Junior College curriculum which is prerequisite to the School of Education program contemplated, may be admitted to the School of Education with deficiencies. Such deficiencies must be removed before graduation and in the sequence prescribed by the student's adviser.

ADVANCED STANDING

An applicant for advanced standing may be considered for admission upon presentation of satisfactory credentials from an accredited institution

of higher learning. The student must be in good standing as to scholarship and conduct and must be eligible to return to the previously attended institution in the semester for which he seeks admission to this University. Credit for transferred work will be assigned by the School of Education to the extent that it meets the requirements for the degree sought at this University and subject to the University regulations concerning satisfactory subsequent work.

For the Master's Degree

Master of Arts in Education.—To be admitted to candidacy for the degree of Master of Arts in Education the applicant must: (1) hold a Bachelor's degree from an accredited institution; (2) have an undergraduate quality-point index of 2.50 or above (*C +* average); (3) have demonstrated a genuine interest in teaching; (4) be in possession of personality traits that give promise of better-than-average success as a teacher.

To be admitted to candidacy in programs designed to prepare for service in guidance and administration two years of successful teaching experience are prerequisite. Candidates who have had no professional courses must satisfactorily complete the required undergraduate professional courses, including a course in student teaching, in addition to graduate course requirements.

ADVANCED STANDING

Graduate work completed in other accredited institutions of learning may be credited toward the Master's degree, but a minimum of 30 semester hours must be completed in the School of Education of The George Washington University. Not more than 9 semester hours of the minimum 30-hour requirement may be taken in off-campus courses.

Advanced courses completed in excess of the requirements for the Bachelor's degree in this University may be credited toward the Master's degree to the extent of 12 semester hours, provided the work fits in with the student's plan of specialization and is approved in writing by the Dean before being undertaken.

In determining advanced standing at the time of admission or re-admission to Master's candidacy at this University, graduate work completed more than three years previously is not counted.

For the Advanced Professional Certificate

A Bachelor of Arts degree in Education or Bachelor of Science degree in Physical Education from the School of Education, or the equivalent from another institution of higher learning; a Master's degree, from an accredited institution, at least two years of successful teaching experience, and a permanent teaching or administrative license are required.

The applicant who is unable to meet the admission requirements may be admitted with deficiencies to be met by satisfactorily completing prerequisites in addition to the specified program of graduate study. Each applicant must be interviewed by a member of the Faculty of the School of Education. The applicant seeking to qualify for a higher level in the local salary scale must have his program approved by the appropriate representative of the school system employing him.

ADVANCED STANDING

Appropriate graduate work completed in other accredited higher institutions may be credited toward the requirements for the Certificate. In determining advanced standing at the time of admission or readmission to Certificate candidacy, graduate work completed more than three years previously is not counted.

For the Degree of Doctor of Education

The candidate for the degree of Doctor of Education must have completed graduate work in fields prerequisite to his objective, equivalent to that required for the degree of Master of Arts in Education in The George Washington University, and at least three years of successful educational experience.

METHODS OF READMISSION

A student who has previously registered in the University, but who has not been in attendance during the semester prior to registration (summer session excluded) should file an application for readmission in advance of registration. If the student is seeking readmission as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must file in the Office of the Director of Admissions complete and official transcripts of record from each institution attended before his application may be considered. All applications for readmission are considered on the basis of regulations effective for the specific semester in which the applicant seeks to enter.

REGISTRATION

Before a student may be admitted to registration he must have satisfied the Office of the Director of Admissions that he is qualified to enter the University.

A student who has previously matriculated in the University, but who has not been in attendance during the semester prior to registration, should file an application for readmission in advance of registration.

Registration is for the semester unless otherwise indicated on the registration card.

tration paper. No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in The George Washington University and another institution without the permission of the dean of the college, school, or division in which he is registered in The George Washington University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration*. Allowance of credit for work done concurrently will be at the discretion of the appropriate Committee on Admission and Advanced Standing.

FEES AND FINANCIAL REGULATIONS

By authorization of the Board of Trustees, the following fees have been adopted:

TUITION FEES

For each semester hour for which the student registers (except work taken by a candidate for a Doctor's degree).....	\$24.00
For the degree of Doctor of Education	
For work* leading to and including the general examination.....	800.00
For work leading to an including the final examination.....	800.00

ADDITIONAL COURSE FEES

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

GRADUATION FEES:

Wherein a degree is conferred.....	25.00
Wherein an Advanced Professional Certificate is conferred.....	25.00

FEE FOR BINDING MASTER'S THESIS.....	6.00
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FEE FOR PRINTING SUMMARY OF DOCTORAL DISSERTATION.....	85.00
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SPECIAL FEES

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	10.00
Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable	5.00
Application for Transfer fee, charged† each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable.....	5.00
Admission tests (when required).....	6.00-12.00

* This fee does not cover the cost of tuition for elementary courses (numbered 1-100).
 † Payable at the time of application for transfer or readmission.

Late-registration fee, charged each student who fails to register within the designated period.....	5.00
Change fee, charged each student for each change in program involving one or more than one course.....	2.00
Withdrawal fee, charged each student who preregisters and withdraws prior to the regular registration.....	5.00
Service fee, charged each student for late payment of tuition (see "Payment of Fees").....	2.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees.....	5.00
Residence fee, charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements.....	24.00
For special physical examination.....	2.00
For each examination to qualify for advanced standing and for each special examination	5.00
Laboratory checkout fee, charged each student in chemistry courses who fails to check out of the laboratory by the time set by the instructor	3.00
Transcript fee, charged for each transcript of record after the first	1.00

Registration in the University entitles each student to the following University privileges; (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library facilities, except as otherwise designated; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described on pages 47-48. These privileges, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

In exceptional cases, subject to the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

* The University work week is Monday through Friday, inclusive.

Arrangements for the above may be made with the Office of the Cashier at the time of registration.

A student who fails to meet payments when due, but who pays his fees within the following two weeks of the date on which payment is due, is charged a service fee of \$2. A student who fails to meet payments within these two weeks after payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of \$5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Application for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean. Notification to an instructor is not an acceptable notice.

In authorized withdrawals and changes in schedules, financial adjustments will be made as follows:

Fall Semester.—Withdrawal dated on or before the last working day* in October, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in November, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in November.

Spring Semester.—Withdrawal dated on or before the last working day* in February, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in March, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in March.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and is cancelled before the regular registration day. In this case a withdrawal fee of \$5 is charged and tuition fees refunded. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

Any student in chemistry or pharmacy who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a checkout fee in the amount of \$3. A student

* The University work week is Monday through Friday, inclusive.

who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Any student enrolled in the Air Force ROTC who fails to turn in uniforms, equipment, and textbooks, on separation from the Corps, will be charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

AMOUNT OF WORK

Fifteen to 17 semester hours constitute a normal program. A student with a quality-point index of 3.00 or higher, may, with the permission of the Dean, enroll for 18 or 19 hours. No student may enroll for more than 19 hours, except by permission of the Committee on Scholarship.

A student with extracurricular employment of 15 hours or less a week is permitted to carry a normal program of college work.

A student with extracurricular employment of from 16 to 25 hours a week may enroll for 12 or 13 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 15 or 16 hours.

A student with extracurricular employment of from 26 to 34 hours a week may enroll for 9 or 10 semester hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 12 or 13 hours.

A student with extracurricular employment of 35 hours or more a week may enroll for 6 or 7 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 9 or 10 hours.

A student who increases his hours of employment subsequent to registration or at any time during a semester is required to report that fact immediately to the Dean so that his program may be brought within the limitations outlined above.

ATTENDANCE

A student is not permitted to attend classes until registration has been completed and fees due have been paid. Regular attendance is required. A student may be dropped from any course for undue absence.

PROBATION

An undergraduate student who fails to maintain a quality-point index of at least 2.00 will be placed on probation. A student remains on probation as long as his quality-point index is below 2.00, or until his probation is removed by the Committee on Scholarship.

SUSPENSION

An undergraduate student on probation who fails to raise his quality-point index to 2.00 within the time specified by the Committee on Scholarship may be suspended. An undergraduate student who fails to make passing grades in one-half or more of a minimum of 16 semester hours of course work may be suspended.

A student who has been suspended, either for delinquency in payment of fees or for any other reason, is not permitted to attend classes during the period of suspension.

A student who has been suspended for poor scholarship may within ten days appeal his case to the Committee on Scholarship through the Dean. If the case appears to be remediable and the student appears likely to improve in his scholarship thereafter, the Committee may readmit him on probation. A student who has been denied readmission on probation may petition the Committee on Scholarship through the Dean for readmission after the lapse of a calendar year. A student who has been suspended twice will not be readmitted.

WITHDRAWAL

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the Dean. Permission to withdraw from the University will not be granted a student who does not have a clear financial record.

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

CHANGES IN PROGRAM OF STUDIES

Changes within the School.—A student may not change or drop courses (see "withdrawals", above) or change his status to that of auditor except with the approval of the Dean, upon presentation of adequate reasons for such changes.

Change from one section to another of the same course may be made with the approval of the Dean and the department concerned.

Change from one major subject to another within the same college or school may be made with the approval of the Dean. All requirements specified in the course of study to which the change is made must be satisfied.

Transfer within the University.—Transfer from one college, school, or division to another may be made only with the approval of the deans

* The University work week is Monday through Friday, inclusive.

concerned. Application for transfer must be made to the Director of Admissions on the proper form provided by his office.

Students wishing to transfer from the Division of University Students or the Division of Special Students to the School of Education should note that a maximum of 45 semester hours will be accepted in transfer.

In order to provide degree candidates with proper academic counsel and the benefits of integrated programs of study, the faculties of the various colleges and schools have established minimum residence requirements and regulations with regard to supervision of the work done in the student's major field. In addition, various special regulations regarding course sequence, selection of electives, and advisory approval of programs apply in particular curricula. Students transferring within the University are advised to study carefully the graduation requirements and to note that in all undergraduate divisions 30 semester hours including at least 12 semester hours in the major field, must be completed in residence in the school or college from which the degree is sought. Upon transfer the student should consult the dean concerned and understand clearly all the requirements he must fulfill.

SUMMER SCHOOL CREDIT

A student who plans to attend summer school sessions at another institution with the intention of having credits so obtained apply toward graduation from this University must first secure the written approval of the Dean. In no event will such credits be recognized to an amount in excess of that which might be earned in a similar period in this institution.

GRADUATION REQUIREMENTS

To be recommended for graduation a student must have met the admission requirements of the college or school in which he is registered, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—It is the student's responsibility to file an application for graduation in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Scholarship.—The undergraduate student must maintain a quality-point index of at least 2.00.

Candidates for the Master's degree and the Advanced Professional Certificate must obtain at least a grade of *Satisfactory* (B level) on each course of the required minimum graduate program and must maintain a quality-point index of at least 2.50 on all prerequisite courses.

Residence.—The undergraduate student and the Master's candidate must complete a minimum of one year or 30 semester hours in residence.

Not more than 9 hours of this requirement may be satisfied by off-campus courses. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior or final year must be completed in residence.

Candidates for the Advanced Professional Certificate must meet a minimum residence requirement of 18 semester hours taken on campus.

Degree candidates are expected to maintain continuous residence by registering for at least one course in each of two of the three terms (fall, spring, summer). Candidates who are unable to enroll for a course but wish to use the library facilities and consult staff members may, with the permission of the Dean, register "in residence" by paying the residence fee. Candidates, who for reasons beyond their control, must temporarily discontinue their studies may be granted leave of absence for one or two terms, on petition to the Dean's Council.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for the Master's or Doctor of Education degrees must be presented in its final form to the Dean no later than the date specified in the Calendar. Three complete copies of each are required. It is the responsibility of the candidate for a graduate degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the thesis and dissertation, which are rigidly enforced.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Presence at Graduation.—A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the Dean.

HONORS

With distinction.—In all undergraduate divisions of the University the degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—Special honors may be awarded by the Faculty to any member of the graduating class for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.

2. The student must meet such other conditions as may be set at the time his candidacy is approved.
3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.
4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card, issued upon the payment of fees, must be presented as identification.

Library books, with the exception of those in the Law and Medical collections, may be drawn for home use for a period of two weeks. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books and periodicals for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

HOURS

The University Library is open from 9:00 A.M. to 10:00 P.M. each class day (Saturday 9:00 A.M. to 5:00 P.M.), and from 2:00 to 6:00 P.M. on Sunday.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, FINANCIAL AID

University Teaching Fellowships.—These are assigned for the academic year to the various departments of instruction. The applicant is expected to be a prospective candidate for a Doctoral degree in the general field of his future doctoral study. Each teaching fellow receives an annual stipend (on a nine-month basis) of up to \$1,700 plus full tuition and laboratory fees for whatever schedule of study or research his fellowship duties permit him to carry. Stipends vary with the work load of the individual teaching fellow. Normally a University teaching fellow renders half-time service in classroom or laboratory assignments to the department of instruction directing his doctoral study. Application should be made to the executive officer of the department of instruction concerned.

Graduate Teaching Assistantships.—These are open in various departments of instruction to candidates for the Master's degrees. Each graduate teaching assistant renders a designated unit of service to his major department of instruction, and receives, depending upon his teaching or laboratory assignment, up to \$1,700 on a nine-month basis plus tuition and laboratory fees for the program of studies which the duties of his assistantship permit him to carry. Application should be made to the executive officer of the department of instruction concerned.

Emma K. Carr Scholarships.—Four scholarships in the amount of \$400 each and ten of \$100 each, established in 1932 by Mrs. Emma K. Carr, are available to "young men (of the white race) for undergraduate or postgraduate work, considering character, capacity, and need".

Mildred Green Memorial Scholarship Fund.—The income from this fund of \$3,317, established in 1959 by Alpha Theta Chapter of Pi Lambda Theta, is awarded annually to a student in the School of Education, upon the recommendation of the donor, which is submitted prior to April 1.

Anna Spicker Hampel Scholarship.—This scholarship, in the amount of \$35, established in 1949 by Mrs. Evelyn Hampel Young in memory of her mother, Anna Spicker Hampel, is available for scholarship aid to young married women students in the School of Education or Columbian College.

Elizabeth V. Brown Scholarship Fund.—A Columbian Women Scholarship fund of \$1,200 created in 1925 by the College Women's Club of Washington, D. C., in memory of Elizabeth V. Brown.

Phi Delta Kappa Prize.—This prize, established in 1956 by Beta Gamma Chapter of Phi Delta Kappa, consists of a \$50 United States Government Savings Bond and is presented annually to the outstanding

senior man in the teacher education program in the School of Education.

Pi Lambda Theta Prize.—This prize, established in 1956 by Alpha Theta Chapter of Pi Lambda Theta, consists of a \$50 United States Government Savings Bond and is presented annually to the outstanding senior woman in the teacher education program in the School of Education.

University Loan Fund.—The Trustees of The George Washington University have made available a fund for short-term loans to students to provide for partial payment of tuition. Applications for these loans shall be made three days prior to the dates on which tuition installments are due.

Home Economics Loan Fund.—This fund of \$382.35, contributed by the D. C. Home Economics Association, is available for loans to senior girls majoring in Home Economics.

National Defense Student Loan Fund.—This fund is available to full time undergraduate and graduate students who are in need of financial assistance. Priority is given those applicants who express a desire to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than August first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

For complete information on other Fellowships, Scholarships, Prizes, Financial Aid, request the Special Bulletin on the subject, which is available in the Office of the Committee on Scholarships, The George Washington University, Washington 6, D. C.

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains four residence halls. Meals are served at the Student Union.

Admission to the University does not include room reservation. A separate application for a room should be made well in advance (for the fall semester by May 1, for the spring semester by January 1). Forms for application, together with detailed information, may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

Girls under the age of twenty-one who are enrolled for twelve or more semester hours of academic work in the University and who are not living with their parents or relatives may live outside the dormitories only with the permission and approval of the Director of Activities for Women, upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Women Students.—The Hattie M. Strong Hall provides single rooms at \$45 a month and double rooms at \$40 a month a person.

The Dolly Madison Hall provides double rooms at \$40 a month a person.

Men Students.—Welling Hall provides double rooms at \$30 a month a person.

The John Quincy Adams Hall provides 69 double rooms, each with study alcove and bath. Rooms rent at \$40 a month a person.

Dormitory payments are due and payable in advance on the first day of each month. A student who fails to meet payments when due, but who makes his payment from the tenth to the fifteenth, inclusive, of the month in which payment is due, is charged a service fee of \$2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued rent and a reinstatement fee of \$5.

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school;* (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.† All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

* A charge of \$2 for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.

† See Rule (5) for exception.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

HONOR SOCIETIES AND PROFESSIONAL ORGANIZATIONS

Alpha Pi Epsilon.—An honorary Home Economics Sorority whose purposes include the improvement of scholarship and leadership standards among Home Economics students.

Student National Education Association.—Provides members with opportunities for developing personal and professional competency through an understanding of the history, ethics, and programs of the organized teaching profession.

Phi Delta Kappa.—An international professional fraternity for men in Education, to promote fellowship based on common interests and ideals which make possible group action for the development of free public education through research, service, and leadership.

Pi Lambda Theta.—A national honorary association for women in Education, dedicated to the conception of education as a profession.

COURSES OF INSTRUCTION

The University reserves the right to withdraw any course announced.

EXPLANATION OF COURSE NUMBERS

First-Group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the Dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group Courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved before the mid-point of the course by the Dean of the School of Education and by the officer of instruction concerned, and when the completion of additional work has been certified by the officer of instruction.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the officer of instruction, to qualified seniors.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is indicated in parentheses after the name of the course. Thus, a year course giving three hours of credit each semester is marked (3-3), and a semester course giving three hours of credit is marked (3).

DEPARTMENT OF EDUCATION

Courses offered by the Department of Education are of two types: those designed for the preservice education of candidates and those planned for the inservice education of teachers, counselors, and administrators.

Preservice courses devote two or three hours a week to lecture and discussion supplemented by a minimum of two hours a week of related field work. A clinical approach to the study of educational problems is used—lectures and discussions revolving around observed practices.

Inservice courses meet once a week for a two-hour period. Class work is supplemented by extensive reading assignments, the preparation of re-

ports, and field work. A student enrolled in one of these courses should plan to devote not less than seven hours a week, exclusive of class time, to the work of the course.

Ample opportunity is provided to study teaching or administrative problems of special interest. To enable students to consult with instructors regarding individual problems, a conference hour is scheduled immediately before or after the class period.

Only the courses designed to provide professional information and skills are listed below. For courses needed for general education or teaching-field preparation, see the general catalogue. In addition to courses offered in the Department of Education a number of professional courses for teachers are offered in the departments of Psychology, Speech, and Statistics. These are listed below together with courses offered by the Department of Education.

Whenever possible, the exact hour of class meeting is stated. Hours for classes not yet scheduled may be found in the Schedule of Classes for the semester concerned.

A Reading Clinic

Coleman and Staff

Diagnosis of reading difficulties; individual or group lessons without academic credit. Fee: for individual diagnosis, \$35; for individual instruction, \$4.50 a lesson; for semi-individual instruction, \$3.50 a lesson; for instruction in small groups with common reading difficulties, \$2.75; material fee, \$4.

SECOND GROUP

109-10 Human Development, Learning, and Teaching (3-3)

Baker, Detwiler

Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. *First half:* fall—section A: M 1:10-3 P.M., section B: W 6:10-8 P.M.; summer 1960. *Second half:* fall—F. 1:10-3 P.M.; spring—section A: M 1:10-3 P.M., section B: W 6:10-8 P.M.; summer 1960 (Detwiler, McCauley). For the general student as well as the prospective teacher. *First half:* nature of human growth, development, and learning, illustrated by observation of children in learning situations. *Second half:* nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations.

11 Methods in Elementary Education (12)

Baker and Staff

Fall—Monday through Friday 9:10-12 A.M. For seniors in the elementary school curriculum. Methods, materials, appraisal, and field experiences in elementary schools. Problems and procedures in teaching the language arts (including reading, literature for children, oral and written expression, spelling, and handwriting), arithmetic and science, social studies. Planning units of work, general classroom procedures, and evaluation of pupil progress. Observation and participation two mornings a week. Prerequisite: Education 109-10 and 121-22.

- 112 *Guidance in Elementary Schools* (3) McCauley, _____
 Fall—T 3:10-5 P.M.; spring—W 7:10-9 P.M.; summer 1960 (Hayes).
 Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Education 109-10, 121-22.
- 113 *Elementary School Art* (3) Nowlin
 Fall: lecture and laboratory—M 7:10-10 P.M., field work—as arranged; spring: lecture and laboratory—T 6:10-9 P.M., field work—as arranged; summer 1960 (Crump). For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Material fee, \$4.50.
- 114 *Elementary School Music* (3) Reed
 Fall—Th 7:35-9:35 P.M., field work (2 hours)—as arranged; spring—Th 7:35-9:35 P.M., field work—as arranged; summer 1960. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22.
- 115 *Teaching of Reading in the Elementary School** (3) Hanigan
 Spring—W 7:10-9:10 P.M., field work (2 hours)—as arranged; summer 1960 (Huse). A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 116 *Elementary School Social Studies** (3) Stratemeyer
 Fall—F 7:10-9:10 P.M., field work (2 hours)—as arranged; summer 1960 (Stratemeyer). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 117 *Elementary School Science** (3) St. Cyr
 Spring—F 6:10-9 P.M., field work (2 hours)—as arranged; summer 1960. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 120 *Elementary School Arithmetic** (3) _____
 Spring—Th 7:35-9:35 P.M., field work (2 hours)—as arranged; summer 1960 (Baker). For teachers. Content, methods, materials and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 121-22 *Society and the School* (3-3) Angel, St. Cyr
 Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. First half: fall—section A: W 1:10-3 P.M., section B: M 6:10-8 P.M. (Rhodes, St. Cyr); summer 1960. Second half: fall—Th 1:10-3 P.M. (Angel); spring—

* This course may not be taken by students who have completed or plan to enroll in Education 111.

section A: W 1:10-3 P.M.; section B: M 6:10-8 P.M.; summer 1960 (Rhodes, Eller). For the general student as well as the prospective teacher. *First half*: the historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. *Second half*: organization and operation of schools; principles and functions; role of the teacher.

128 *Children's Literature** (3)

Walker

Spring—M 7:10-9:10 P.M., field work (2 hours)—as arranged; summer 1960 (Wilson). For teachers. Exploring and evaluating the newer books for children and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22.

131 *Common Teaching Skills in Secondary Schools* (3) Detwiler

Fall—TTh 12:30-1:45 P.M.; spring—MTh 4:30-5:45 P.M. For seniors in the secondary school curriculum. Course, unit, and lesson planning; practical techniques used in connection with motivation, the assignment, group procedures, directing study, individual differences, evaluation, clerical routines, disciplines, the homeroom, activity sponsorship, public relations. Prerequisite: Education 109-10 and 121-22.

133-34 *Observation and Student Teaching in Secondary Schools* (3-3 to 6) Detwiler

A year course: credit is not given for the first half until the second half is completed. 133A: fall—as arranged; 133B: spring—as arranged. 134A and 134B: spring—as arranged. For seniors in the secondary school curriculum. Section B is for students enrolled in the intensive program. Education 134 student-teaching fee, \$50. Admission by permission of the instructor. Prerequisite: Education 109-10 and 121-22.

135 *Student Teaching in Elementary Schools* (9) Baker, McCauley

135A, 135B, and 135C: spring—as arranged. For seniors in the elementary school curriculum. Student-teaching fee, \$50. Admission by permission of the instructor. Prerequisite: Education 109-10 and 121-22.

SPECIAL METHODS COURSES†

To be elected in the senior year after substantial preparation in the teaching fields concerned by the students in the secondary school curriculum. Course requirements and hours of credit vary with license requirements. Practices of successful teachers are studied and actual teaching content as found in current texts and courses of study is reviewed.

136 *Teaching English* (2 to 4)

Lumsden

Spring—M 7:10-9 P.M., field work (2 hours)—as arranged. Prerequisite*: 18 semester hours in English.

* This course may not be taken by students who have completed or plan to enroll in Education 111.
† Prerequisite to all special methods courses: Education 109-10, 121-22, and 131. Additional prerequisites are stated under each course.

- 138 *Teaching Social Studies* (2 to 4) Whipple
 Spring—T 7:35-9:35 P.M., field work (2 hours)—as arranged. Prerequisite:
 site*: 24 semester hours of social studies.
- 140 *Teaching Mathematics* (2 to 4) Snader
 Spring—Th 7:35-9:35 P.M., field work (2 hours)—as arranged. Prerequisite:
 site*: Mathematics through calculus.
- 144 *Teaching Science* (2 to 4) Eller
 Spring—T 7:35-9:35 P.M., field work (2 hours)—as arranged. Prerequisite:
 site*: 24 to 40 semester hours of science.
- 146 *Teaching Foreign Languages* (2 to 4) McSpadden
 Spring—T 5:10-7 P.M., field work (2 hours)—as arranged. Prerequisite*:
 18 semester hours of one foreign language.
- 148 *Teaching Home Economics* (2 to 4) Kirkpatrick
 Spring—as arranged. Prerequisite*: 30 semester hours of Home Economics.
- 150 *Teaching Business Subjects* (2 to 4) Shott
 Spring—S 9:10-11 A.M. Prerequisite*: 30 semester hours of business edu-
 cation.

THIRD GROUP†

- 201-2 *Human Development, Learning, and Teaching* McCauley
 (3-3)
 Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged.
 Academic year—section A: M 7:10-9:10 P.M., section B: Th 7:35-9:35
 P.M. For graduate students. *First half*: nature of learning approached
 through the study of classroom situations. *Second half*: nature of teaching
 approached through observation of classroom situations.
- 203-4 *Comparative Education* (3-3)
 Not offered 1960-61. Comparison of foreign educational systems with those
 of the United States; particularly those of Russia, West Germany, Denmark,
 Switzerland, France, the British Isles, Canada, and Australia.
- 205-6 *The Curriculum*‡ (3-3) St. Cyr
 Academic year—S 11:10 A.M.-7 P.M. For experienced teachers. *First half*:
 curriculum foundations and issues; comparison of curriculum patterns. *Second*
half: principles and procedures in curriculum development; group consideration
 of student problems.

* Prerequisite to all special methods courses: Education 109-10, 121-22, and 131. Additional
 prerequisites are stated under each course.

† A degree from an accredited institution is prerequisite to all third-group courses.

‡ Prerequisite: adequate professional preparation.

207 *Curriculum Materials** (3)

St. Cyr

Summer 1960. For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations.

209 *Child Growth and Development* (3)

Scott

Fall—F 7:10-9:10 P.M. An interdisciplinary approach to child development taking into account such factors as society and culture, socialization, and socializing agents with particular emphasis on the home and school.

210 *Adolescent Growth and Development* (3)

Spring—F 7:10-9:10 P.M. A consideration of physical, intellectual, and cultural backgrounds of adolescence with particular emphasis on social development, adjustment to organized society, educational development and adjustment to school, and home relationships.

211 *Evaluation in Education** (3)

Roberts

Fall—T 7:35-9:35 P.M.; summer 1960 (Roberts). Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation.

212 *Educational Measurement* (3)

McCauley

Spring—T 7:35-9:35 P.M. Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay-type examinations; statistical analysis of tests results; laboratory experiences in the use of test instruments.

213-14 *History of Education* (3-3)

Wilson

Academic year—T 7:35-9:35 P.M. *First half:* the European backgrounds of American education. *Second half:* the evolution of the American school system.

215 *Education of Exceptional Children** (3)

LaBue

Fall—M 7:10-9:10 P.M.; summer 1960 (LaBue). For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance.

216 *Education of Slow-learning Children** (3)

LaBue

Not offered 1960-61. Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.

217-18 *Philosophy of Education** (3-3)

Darland

Academic year—M 7:10-9:10 P.M.; summer 1960—Education 218 (3) (Darland). *First half:* designed to help students formulate a personal philosophy of education. *Second half:* social foundations of education—a study of the forces that shape the policies and offerings of the school.

* Prerequisite: adequate professional preparation.

219 *Elementary School Classroom Procedures** (3)

LaBue

Summer 1960. Current classroom practices with particular emphasis on ways of planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences.

221 *Early Childhood Education** (3)

Not offered 1960-61. For experienced teachers. Emphasis on methods, materials, and learning experiences designed to meet the developmental needs of kindergarten and primary-grade children.

223-24 *Reading Problems** (3-3)

Coleman

Academic year—W 7:10-9:10 P.M. For experienced teachers. Study of reading difficulties on elementary and secondary school levels; classroom and clinical procedures in solving reading problems.

225 *Elementary School Reading* (3)

Coleman

Summer 1960. For experienced teachers. Developmental and remedial approaches to reading problems. Demonstration of diagnostic and corrective techniques used by the classroom teacher and the reading specialist.

227 *Basic Issues in Elementary Education* (3)

LaBue

Fall—S 9:10-11 A.M. A consideration of basic issues in the purposes, organization, and conduct of elementary education. Emphasis on the philosophical and psychological roots of fundamental assumptions as they relate to classroom practices.

228 *Instructional Areas in Elementary Education* (3)

LaBue

Spring—S 9:10-11 A.M. Critical appraisal of the objectives, organization, content, and teaching methods in the language arts, arithmetic, social studies, science, arts and crafts, health and physical education.

229 *Administration of Elementary Education* (3)

Spring—Th 7:35-9:35 P.M.; summer 1960 (LaBue). For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action.

231 *Secondary School Classroom Procedures** (3)

Giancaspro

Fall—Th 7:35-9:35 P.M.; summer 1960. Survey of current classroom practices with particular attention to selected topics such as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.

* Prerequisite: adequate professional preparation.

- 233 *Audio-visual Education** (3)
 Spring: lectures (2 hours), laboratory (1 hour)—W 6:10-9 P.M. Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the care, operation, maintenance, and use of audio-visual materials and equipment. Material fee, \$7.
- 234 *Teaching Composition in the Junior and Senior High School* (3) Lumsden
 Summer 1960. For experienced teachers of English. Methods and materials for improving writing skills; exploring ways to achieve the goal of a theme a week as recommended in the Conant Report. Particular attention to successful techniques, standards of performance, methods of grading; use of style sheets and literary models, and the relationship of the study of grammar to writing.
- 241 *Education of the Gifted** (3) ———, Jenkins
 Spring—F 7:10-9:10 P.M.; summer 1960. For classroom teachers. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects.
- 243 *Human Relations in the Classroom** (3) Marinaccio
 Summer 1960. Principles and practices involved in interpersonal relationships between learner and teacher and among learners.
- 245 *School and Community** (3) Angel
 Spring—T 7:35-9:35 P.M.; summer 1960. The school as an important member of a team of social agencies that builds the community.
- 247 *Vocational Education** (3) Walsh
 Summer 1960. Development in the United States; current conceptions, agencies involved, problems, and trends.
- 251 *Guidance in Secondary Schools** (3) ———, McDaniels
 Fall—M 7:10-9:10 P.M.; summer 1960. Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program.
- 254 *The Junior High School** (3) Root
 Not offered 1960-61. Purposes, organization, core programs, guidance, developing course of study, extra-classroom activities.
- 255-56 *Secondary Education** (3-3) Root
 Academic year—S 9:10-11 A.M.; summer 1960. *First half:* current proposals for the improvement of secondary education. *Second half:* current problems in each of the subject-matter fields.
 * Prerequisite: adequate professional preparation.

259-60 *Secondary School Management** (3-3)

H. Johnson

Academic year—S 9:30 A.M.-3 P.M. For experienced teachers and administrators with two years of successful teaching in secondary schools. Management planning, execution, and control; criteria of good management, construction of the master schedule; leadership problems incident to the development of new policies and programs.

263-64 *Employee Training* (3-3)

Root

Academic year—W 7:10-9:10 P.M. *First half*: nature and purpose, review of major programs—orientation, supervisory, apprentice, clerical skills, communication. *Second half*: administrative problems and practices, training media, coordination with other management functions. Prerequisite: adequate professional preparation or two years of experience in employee training.

265-66 *Teaching Secondary School English*
(3-3)Lumsden and
Guest Lecturers

Not offered 1960-61. A refresher course for teachers of English. Discussion of new approaches to high school content. Offered in cooperation with the departments of English and Speech. *First half*: communication skills—structural linguistics, composition, and speech. *Second half*: American and English literature.

267-68 *Teaching Secondary School Social Studies* (3-3)

Whipple

Academic year—W 7:10-9:10 P.M. A refresher course for teachers of the Social Studies. Discussion of new approaches to high school content. Offered in cooperation with the departments of History, Political Science, Geography, Economics, and Sociology and Anthropology.

270 *Art Education* (3)

Nowlin

Not offered 1960-61. For experienced teachers. Basic philosophies of contemporary teachers of art; use of visual and tactile media; emphasis upon visual aids, displays, and use of community resources. Designed to increase awareness of the creative process. Prerequisite: Education 113. Material fee, \$4.50.

271 *The Teacher and School Administration** (3)

Fox

Fall—W 7:10-9:10 P.M.; summer 1960. A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions.

272 *The Teacher and School Supervision** (3)

Fox

Spring—W 7:10-9:10 P.M. Nature, organization, human relationships, and techniques.

273-74 *Teacher Education** (3-3)

LaBue

Not offered 1960-61. *First half*: aims, objectives, and basic issues; study of outstanding and experimental programs. *Second half*: recruitment and selection.

* Prerequisite: adequate professional preparation.

tion, general education, teaching-field preparation, professional sequences, laboratory experiences.

275 *School Finance** (3)

Hutchins

Summer 1960. Educational financial theory, practice, and control, including methods of financing.

276 *Seminar: Public Relations in School Administration** (3)

Spring—M 7:10-9:10 P.M. Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.

278 *School Law** (3)

Remmlein

Not offered 1960-61. Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group.

279-80 *Adult Education** (3-3)

Holden

Academic year—Th 7:35-9:35 P.M.; summer 1960—Education 280 (3) (Detwiler). *First half:* current concepts and objectives, agencies involved, programs on all levels—international through community. *Second half:* the adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs.

281 *Group Procedures in Education** (3)

Detwiler

Fall—T 7:35-9:35 P.M. Theory, practice, evaluation, and application to all educational levels.

285 *Extra-classroom Activities** (3)

Suber

Fall—Th 7:35-9:35 P.M. Nature and purposes of selected activities—home-room, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation.

287-88 *Clinical Study of Reading Problems** (3-3) Coleman

Academic year—F 5:10-7 P.M. For advanced students. Diagnostic and corrective work under supervision of the Reading Clinic. Each student is expected to diagnose and treat pupils who are retarded in reading. Case studies are presented and criticized. Prerequisite: Education 223-24 or the equivalent. Material fee, \$5 a semester.

289-90 *Supervisory Problems in Reading** (3-3) Coleman

Not offered 1960-61. For experienced teachers, principals, supervisors, and superintendents. Considers the problems involved in planning, reorganizing, and improving the total reading program, in promoting cooperative effort on the part of the staff toward increasing teaching efficiency.

* Prerequisite: adequate professional preparation.

- 291 *Planning the School Plant* (3) Hamon
Not offered 1960-61. Selection of sites; evaluation of existing buildings; utilization of present facilities; adaptation to curricular needs; building, operation, and maintenance problems.
- 293-94 *Research* (3-3) The Staff
Academic year—as arranged. Individual research under the guidance of a member of the staff. Program and conferences arranged with an instructor.
- 295 *Educational Research Methods and Procedures* (3) LaBue
Fall—T 5:10-7 P.M.; spring—Th 5:10-7 P.M.; summer 1960. Required of all Master of Arts candidates following Plan 2. Knowledge of elementary statistics required.
- 297 *Reading in Education* The Staff
Academic year—W 5:10-6 P.M.; summer 1960. To assist those preparing for the comprehensive examinations. No credit toward degree requirements. Tuition fee, \$24.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged. Required of all Master of Arts candidates following Plan 1.

DEPARTMENTS OF PHYSICAL EDUCATION

The following courses are offered by the Department of Physical Education for Men and the Department of Physical Education for Women. Whenever possible the departments offer lecture courses jointly.

FIRST GROUP

- 43-44 *Techniques of Physical Education Motor Activities* (2-2) DeAngelis, Krupa
Academic year—morning. Fundamental skills, rules, and organization. Locker and towel fee,* \$4.50 a semester.
- 45-46 *Methods and Materials for Teaching Individual and Dual Sports in Secondary Schools* (2-2) Hanken, Krupa
Academic year—afternoon. Tennis, golf, swimming, wrestling, badminton, bowling. Locker and towel fee,* \$4.50 a semester.
- 47 *Introduction to Physical Education* (2) Myers
Fall—morning. An orientation course presenting the problems of physical education, vocational analysis, scientific foundations, and scope of field.
- 48 *Introduction to Recreation* (2) Hanken
Spring—as arranged. The role of recreation in modern living; current practices in community recreation work; standards of training, experience, and salary; types of leadership.

* The locker and towel fee is required for registration in one or more of the activity courses.

49 *Human Anatomy* (3)

Stallings

Fall—morning. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1-2 or Zoology 1-2.

50 *Kinesiology* (3)

Lawrence

Spring—morning. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

51-52 *Methods and Materials for Teaching Physical Education Activities* (2-2) (women) The Staff

Academic year—as arranged. Team sports: basketball, hockey, softball, soccer, speedball, volleyball. Individual and dual sports: badminton, tennis, golf, archery, swimming and diving, lifesaving and water safety. Group gymnastics. Tumbling. Locker and towel fee,* \$4.50 a semester.

58 *First Aid and Care of Athletic Injuries* (2)

DeAngelis

Spring—morning. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1-2 or Zoology 1-2.

SECOND GROUP

101 *Physical Education in the Elementary School* (3)

Atwell, Burtner

Fall—evening; spring—afternoon. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, and self-testing activities.

103 *History and Principles of Physical Education* (3)

Atwell, Krupa

Fall—morning. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.

105-6 *Adapted Physical Education and Physical Examinations* (3-3) Lawrence

Academic year—morning. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription of exercises, and program adaptation. Prerequisite: Physical Education 49 and 50.

107 *Techniques for Teaching Recreational Dance* (1 to 2)

Burtner

Fall—morning. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary-school

* The locker and towel fee is required for registration in one or more of the activity courses.

age and adult groups. Square-dance calling is included. Locker and towel fee,* \$4.50.

109-10 *Leadership Organization in the Intramural Program* (2-2) DeAngelis

Academic year—afternoon. Principles of administration, organization, and supervision of intramural activities in the physical education program of the junior high school, senior high school, and college.

111-12 *Methods and Materials for Teaching Physical Education Activities* (2-2) (women) The Staff

Academic year—afternoon. Continuation of methods and materials in activities listed under Physical Education 51-52. Locker and towel fee,* \$4.50 a semester.

113-14 *Methods and Practice in Teaching Physical Education Activities* (2 to 4-2 to 4) Hanken and Staff

Academic year—afternoon. Principles and methods applied to teaching physical education activities. Supervised laboratory. Locker and towel fee,* \$4.50 a semester.

115-16 *Methods and Materials for Teaching Team Sports in Secondary Schools* (2 to 4-2 to 4) (men) DeAngelis, Hanken

Academic year—morning. Football, basketball, baseball, track and field. Locker and towel fee,* \$4.50 a semester.

117 *Methods of Teaching Modern Dance* (1 to 2) Burtner

1960-61 and alternate years: fall—afternoon. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee,* \$4.50.

118 *Dance Production* (1 to 2) Burtner

1960-61 and alternate years: spring—afternoon. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee,* \$4.50.

121 *School and Community Health Programs* (3) Krupa

Fall—afternoon. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1-2 or Zoology 1-2.

122 *Methods and Materials for Health Education* (3) Atwell

Spring—evening. Methods and materials for teaching health at each age level. Prerequisite: Biology 1-2 or Zoology 1-2.

131 *Tests and Measurements in Physical Education* (3) Krupa

Fall—morning. Critical survey of tests in physical activities, methods of test construction, elementary statistics.

* The locker and towel fee is required for registration in one or more of the activity courses.

132 *Camp Leadership* (1 to 2)

Stallings

Spring—afternoon. Survey of outdoor education programs with special emphasis on leadership techniques for counselors.

133-34 *Observation and Student Teaching*
(3-3 to 6)

Myers, Stallings

First half: fall and spring—as arranged. Second half: fall and spring—as arranged. Assignments are made to schools in Washington and the vicinity. Physical Education 134, student teaching fee, \$50.

136 *Survey of Dance History and Dance Forms* (3)

Burtner

1961-62 and alternate years. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnologic dance, practice and discussion of fundamental movement techniques, and composition.

138 *Organization and Administration of Physical Education* (3)

Krupa

Spring—morning and evening. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.

151-52 *Recreational Leadership Activities*
(1 to 3-1 to 3)

Abernethy

1961-62 and alternate years. Fall semester: basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. Spring semester: basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.

161 *Community Organization for Recreation* (3)

Thompson

1960-61 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.

162 *Administration of Community Recreation Programs* (3)

Thompson

1960-61 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

REQUIRED AND ELECTIVE COURSES FROM
OTHER DEPARTMENTS

PSYCHOLOGY

17 *Introduction to Educational Psychology* (3)

Lindley, Faith

Fall—evening; spring—morning; summer 1960. Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

- 29 *Child Psychology* (3) Johnson
Fall—morning; spring—evening; summer 1960. A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.
- 121 *Educational Psychology* (3) Lindley
Spring—evening. Advanced course in educational psychology. Designed for those with background in education and psychology.
- 129 *Introduction to Counseling and Guidance* (3) Dreese
Fall—evening; summer 1960. A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.
- 131 *Psychological Tests* (3)
Fall—morning; spring—evening; summer 1960. A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7.
- 141 *Leadership, Group Behavior, and Student Life* (3) Faith
Fall—morning. A survey of the foundations of leadership, of the factors which underlie effective participation in group activities, and of the interrelations between the student and his university.
- 144 *Personnel Psychology* (3) Hubbard, Mosel
Academic year—evening; summer 1960. The applications of psychology to personnel work in education, business, industry, and government.
- 225 *Seminar: Mental Hygiene* (3) Hunt
Fall—afternoon; summer 1960. A study of mental health problems with special attention to programs of prevention.
- 226 *Seminar: Clinical Psychology of Childhood and Adolescence* (3) Johnson
Spring—afternoon. A survey of behavior and personality disorders.
- 227 *Seminar: Counseling and Guidance* (3) Dreese
Spring—evening. Recent developments and current problems in vocational, educational, and personal guidance in various types of agencies with particular reference to education. Prerequisite: educational or psychological measurements and Psychology 129 or the equivalent.
- 228 *Seminar: Techniques of Counseling* (3) Dreese
Fall—evening; spring—evening; summer 1960. An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed.

229 *Seminar: Occupational and Educational Information* (3) ———, Faith

Fall—evening; spring—evening. Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and disseminating for purposes of guidance.

231 *Test Construction* (3)

Hunt

Fall—evening. The principles underlying test construction; statistical techniques in the construction, evaluation, and standardization of psychological, educational, and vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.

232 *Research: Test Construction* (3)

Hunt

Fall—as arranged; spring—as arranged. Individual projects in construction and evaluation of psychological, educational, or vocational tests. Prerequisite: Psychology 231 and permission of the instructor.

233 *Individual Psychological Testing* (3)

Johnson

Fall—afternoon; spring—afternoon. Instruction and practice in giving of the Binet and Wechsler tests. Prerequisite: an elementary course in tests and measurements. Material fee, \$7.

236 *Seminar: Analysis of the Individual for Purposes of Counseling* (3) Faith, ———

Fall—evening; spring—evening. A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements.

STATISTICS

53 *Introduction to Statistics in Psychology and Education* (3)

The Staff

Lecture (2 hours), laboratory (2 hours). Fall: lecture—morning and evening, laboratory—afternoon and evening; spring—morning and evening; summer 1960. Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, frequency distributions, reliability and validity of tests, normal curve, correlation, elementary sampling, and an introduction to estimation and tests of hypotheses. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

105 *Statistics in Psychology and Education* (3)

Bright

Spring: lecture (2 hours), laboratory (2 hours)—morning. Advanced study of statistical techniques necessary for an application of statistics in research problems. Analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 53. Laboratory fee, \$9.

THE GEORGE WASHINGTON UNIVERSITY

1821

The Junior College

1930

Columbian College (the Senior College)

1821

The Graduate Council

1893

The School of Medicine

1825

The Law School

1865

The School of Engineering

1884

The School of Pharmacy

1906

The School of Education

1907

The School of Government

1928

The College of General Studies

1950

The Division of University Students

1930

The Division of Special Students

1944

The Division of Air Science

1951

The Summer Sessions

1916

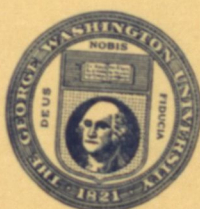
The University Hospital

1898

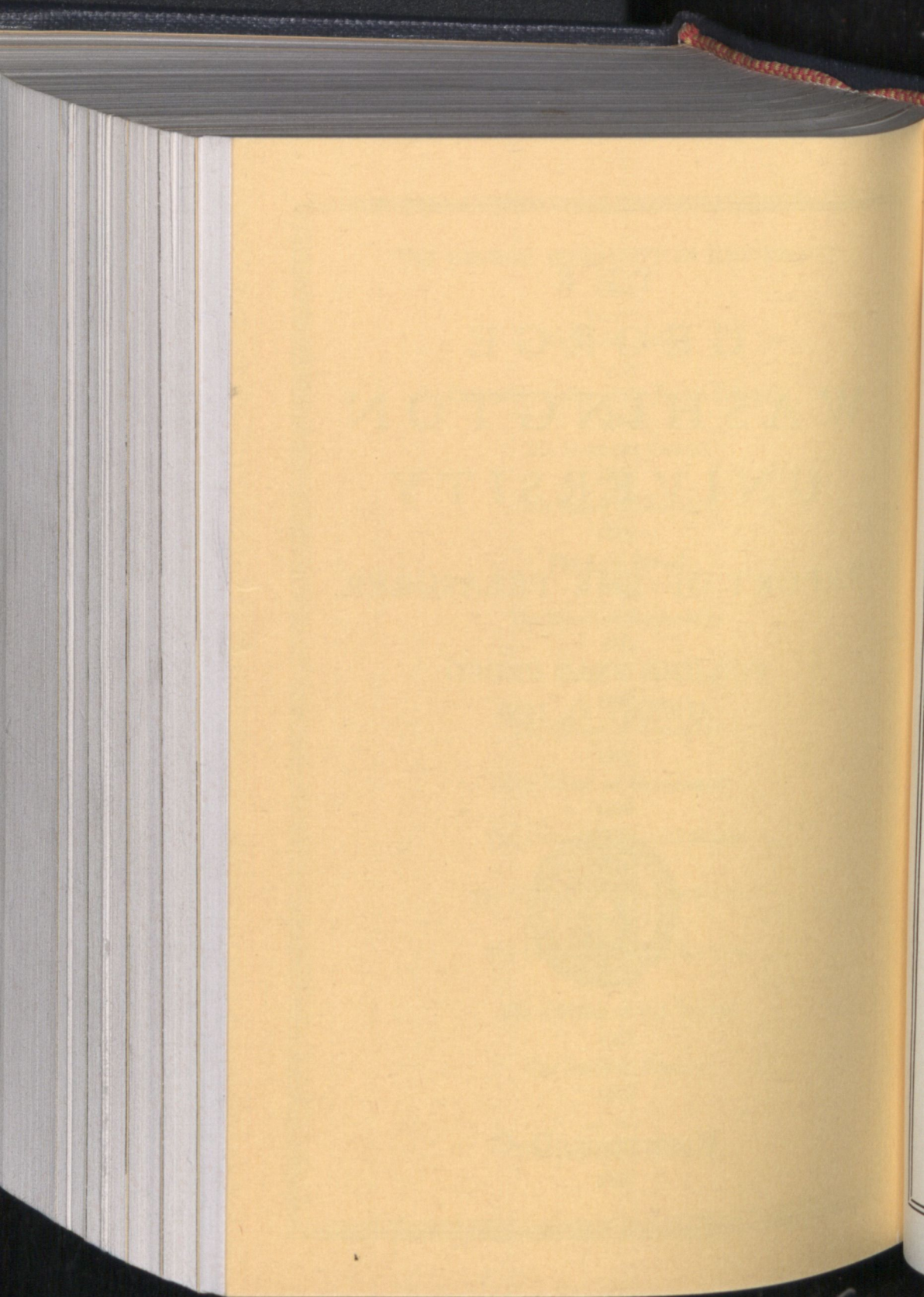
THE
GEORGE
WASHINGTON
UNIVERSITY

REPORT OF THE TREASURER

FOR THE YEAR ENDED
AUGUST 31, 1960



WASHINGTON, D. C.



THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, D. C.

Report of the Treasurer

FOR THE YEAR ENDED

AUGUST 31, 1960

LETTER OF TRANSMITTAL

December 30, 1960

TO THE PRESIDENT AND THE BOARD OF TRUSTEES
THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, D. C.

GENTLEMEN:

I am submitting herewith the Report of the Treasurer of The George Washington University for the fiscal year ended August 31, 1960. This report is a review of the budget operations for the year and is based on the budget approved by the Board of Trustees of the University.

The accounts of the University are kept and its financial reports arranged as far as practicable in conformity with the recommendations of the National Committee on Standard Reports for Institutions of Higher Education. Under that plan the funds of the University are classified in various fund groups, and the accounts and financial statements segregate clearly the assets and liabilities of each of these groups as indicated in the balance sheet, Exhibit A.

Price Waterhouse & Co. have examined the accounts of the University for the past year, and their report is submitted herewith.

A condensed summary of the principal facts in the report is presented below and on succeeding pages, followed by detailed Exhibits and Schedules.

Respectfully submitted,
HENRY W. HERZOG
Treasurer

CONDENSED SUMMARY

CURRENT FUNDS

These Funds represent assets which are available for immediate use in the current operation of the University.

Current Income for the Year (Exhibit B and Schedule 1).....	16,238,778.51
Current Expense for the Year (Exhibit B and Schedule 2).....	16,185,945.15
Excess of Current Income over Current Expense (Exhibit B).....	<u>52,833.36</u>

The latter amount was added to Current Funds Surplus. Surplus at the end of the year amounted to \$1,338,570.96 (Exhibit C). During the year there was transferred from Surplus to Net Investment in Plant \$616,343.88 for the purchase of land and buildings, equipment, and for the reduction of trust notes payable.

Included in the Accounts Receivable of \$974,582 due from the United States Government resulting from cost reimbursable research contracts is approximately \$315,000 of overhead expense allocated to certain contracts with various agencies of the Department of Defense. The allocation of these expenses was made by the University consistent with policies followed in the preceding several years. The Armed Services Board of Contract Appeals issued an opinion disallowing these receivables. The University is reviewing this opinion to determine what recourse is available to effect their collection.

Designated funds are recorded in Exhibit D and Schedules 10, 10A, 10B, 10C.

During this year designated gifts and grants for use as specified amounted to \$4,663,272.71. Unexpended funds totaled \$1,777,254.55 (Exhibit D).

LOAN FUNDS

For the assistance of students seeking financial aid, loan funds have been established (Schedule 4). Loans are made at a low rate of interest and when repaid the interest is added to the principal of the funds.

During the year, 769 loans were made to students. Loan funds totaled \$223,901.38.

ENDOWMENT FUNDS

The principal of endowment funds amounted to \$7,530,188.27 (Exhibit F), an increase of \$289,692.02. This increase is accounted for in large part by a bequest of Alma Hand Britten in the amount of \$257,251.31, the income to be used for scholarships. The endowment funds are represented by assets which, under the terms of wills, deeds of gift, or under the by-laws of the University, must be held in perpetual trust for income-producing purposes. The principal amount and changes during the year are recorded in Schedule 12.

"Consolidated Endowment Funds" consisted of 147 endowments with a total value of \$6,094,734.91 (Schedule 5). The assets of these funds are combined to eliminate the possibility of partial or total loss of any fund through the failure of a specific investment, and to avoid temporary suspension of income and the carrying of uninvested small cash balances, and to give equality of treatment to all funds. Unless otherwise restricted by the donors, the assets of all new endowments are added to the assets of the Consolidated Endowment Funds.

Reserves for Protection of Investments were as follows: Consolidated Endowment Funds, \$113,678.91; Scottish Rite Fund, \$56,570.36 (Schedule 12).

Earnings of Consolidated Endowment Funds are recorded in one income account and at the end of the year are distributed to individual funds using the market value basis of distribution. The average rate of return on the investments of these funds amounted to 4.8024% during the past year; however, income was actually distributed on the basis of units assigned to each fund.

The Scottish Rite Endowment Fund earned 6.2558% net income on its investments during the year just ended.

Net income from all investments for the year was \$392,169.38 (Schedule 10A).

Pledges to the School of Medicine Endowment Fund on August 31, 1960, totaled \$260,440.00.

PLANT FUNDS—UNEXPENDED

Cash and other assets for development of the physical plant comprise these funds (Schedule 7). At the end of the year the balance was \$521,792.52 (Exhibit G).

TO THE PRESIDENT AND THE BOARD OF TRUSTEES
THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, D. C.

December 30, 1960

We have examined the accompanying balance sheet of The George Washington University as at August 31, 1960, and the summary of current income and expense, summary of current funds surplus and summaries of other funds (Exhibits A through H) for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary.

Reimbursement of certain costs incurred by the University which were allocated to research projects undertaken on behalf of United States military departments has been disallowed by the United States Government's Armed Services Board of Contract Appeals. A subsequent Government motion for reconsideration and a cross-motion by the University resulted in very little change in the original decision. Under the decision approximately \$315,000 of the total of \$974,582 included in the University's August 31, 1960, balance sheet as receivable from the Government could not be reimbursed. The University is reviewing the decision and the results of the appeal to determine what recourse, if any, is available to effect collection of these receivables.

In our opinion, subject to the comments in the preceding paragraph, the accompanying financial statements (Exhibits A through H) present fairly the financial position of The George Washington University as at August 31, 1960, and the results of its operations for the year then ended, in conformity with generally accepted principles of accounting applied on a basis consistent with that of the preceding year.

PRICE WATERHOUSE & CO.

THE GEORGE WASHINGTON UNIVERSITY
BALANCE SHEET
August 31, 1960
ASSETS

CURRENT FUNDS

Cash.....	1,079,004.77	
Investments (Note 1) (Schedule 3) (market value \$310,065).....	309,858.50	
Cash and securities on deposit with Trustee (Note 7).....	92,612.78	
Accrued Interest.....	40,100.00	
Note Receivable (Schedule 3).....	69,862.37	
Accounts Receivable—U. S. Government—Cost Reimbursable Research Contracts.....	974,582.05	
" Hospital Patients, less \$120,000 for doubtful accounts.....	628,083.61	
" Other.....	47,990.78	
Prepaid Expense.....	1,650,656.44	
	<u>400,038.84</u>	3,642,133.70

LOAN FUNDS

Cash.....	85,743.01	
Loans Receivable (Schedule 4).....	138,158.37	
	<u>223,901.38</u>	

ENDOWMENT FUNDS

Cash.....	5,938.38	
Investments (Note 1) (Schedule 5).....		
Stocks and Bonds (market value \$8,478,475).....	6,932,919.81	
Real Estate.....	184,246.00	
Trust Notes.....	28,201.08	
Funds Held in Trust by Others (Schedule 6).....	7,151,305.27	
	<u>378,883.00</u>	7,530,188.27

PLANT FUNDS—UNEXPENDED

Cash.....	41,215.03	
Investments (Note 1) (Schedule 7) (market value \$481,860).....	480,577.49	
	<u>521,792.52</u>	

INVESTED IN PLANT

Land and Buildings (Note 2) (Schedule 8).....	22,141,776.48	
Equipment (Note 2) (Schedule 9).....	3,192,312.42	
	<u>25,334,088.90</u>	

TOTAL

		<u>37,252,104.77</u>
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LIABILITIES, FUNDS, SURPLUS

CURRENT FUNDS

Accounts Payable and Accrued Expense.....	485,563.54	
Deferred Income.....	40,744.65	
Designated Funds (Note 3) (Exhibit D)		
Sponsored Research.....		
Investment Income.....	904,238.17	
Miscellaneous.....	112,700.67	
Agency.....	751,846.86	
	<u>8,468.85</u>	
Surplus (Exhibit C).....	1,777,254.55	
	<u>1,338,570.96</u>	3,642,133.70
LOAN FUNDS—Balances (Exhibit E).....		
ENDOWMENT FUNDS—Balances (Exhibit F).....		223,901.38
PLANT FUNDS—Unexpended Balances (Note 4) (Exhibit G).....		7,530,188.27
INVESTED IN PLANT		
Notes Payable, 4½%, due November 28, 1960 (Note 5).....		521,792.52
Trust Notes Payable (Note 6).....		
Bonds Payable (Note 7).....	500,000.00	
	884,768.23	
Net Investment in Plant (Exhibit H).....	1,250,000.00	
	<u>22,699,320.67</u>	25,334,088.90
TOTAL.....		<u>37,252,104.77</u>

SUMMARY OF CURRENT INCOME AND EXPENSE

For the Year Ended August 31, 1960

INCOME (Schedule 1)	
Educational and General	
Student Fees.....	5,011,415.07
Endowment and Plant Funds Income—portion used.....	330,324.94
Gifts—portion used.....	310,440.92
Student Activities.....	100,529.37
Miscellaneous.....	248,209.48
Sponsored Research—grants used and contract reimbursements.....	4,275,409.16
Hospital (Note 3).....	5,199,079.00
Auxiliary Enterprises.....	15,475,407.94
	<u>16,238,778.51</u>
EXPENSE (Schedule 2)	
Educational and General	
Administration and General.....	1,566,331.58
Instruction and Departmental Research.....	3,460,941.33
Libraries.....	200,963.08
Maintenance and Operation of Plant.....	720,401.98
Student Activities.....	218,866.11
Sponsored Research.....	4,275,409.16
Hospital.....	5,311,713.97
	<u>15,754,627.21</u>
Less overhead allocated to Sponsored Research and Hospital.....	15,227,255.48
Auxiliary Enterprises.....	714,590.82
Student Aid.....	<u>244,098.85</u>
EXCESS OF CURRENT INCOME OVER CURRENT EXPENSE—EXHIBIT C.....	16,185,945.15
	<u>52,833.36</u>

SUMMARY OF CURRENT FUNDS SURPLUS

For the Year Ended August 31, 1960

BALANCE AUGUST 31, 1959.....	TOTAL	UNAPPROPRIATED	APPROPRIATED FOR HOSPITAL	RESERVE FOR BOND RETIREMENT
	1,503,774.22	174,584.13	1,271,059.01	58,131.08
ADDITIONS OR (DEDUCTIONS)				
Excess of Current Income over Current Expense.....	52,833.36	165,468.33	(112,634.97)	
Hospital Depreciation included in Current Expense for which there was no outlay of Current Funds (Schedule 2).	126,800.00		126,800.00	
Interest Earned—Bond and Interest Sinking Fund.....	1,404.78			1,404.78
Transfers				
Net Investment in Plant equal to cost of non-departmen- tal capital additions from Current Funds (Exhibit H).				
Bond Retirement (Note 6).....	(616,343.88)	(428,063.01)	(188,280.87)	
Medical Sciences Fund (Schedule 10B).....		(21,097.76)		21,097.76
Loan Funds (Schedule 11).....	272,013.56	159,378.59	112,634.97	
Hospital Building Fund (Schedule 13).....	(900.44)	(900.44)		
Unappropriated Surplus.....	(1,010.64)		(1,010.64)	
		64,450.00	(64,450.00)	
BALANCE AUGUST 31, 1960—EXHIBIT A.....	1,338,570.96	113,819.84	1,144,117.50	80,633.62

EXHIBIT C

THE GEORGE WASHINGTON UNIVERSITY
NOTES TO FINANCIAL STATEMENTS

August 31, 1960

NOTE 1

Investments are stated at cost or at fair market value at date of acquisition except for certain real estate which is stated at depreciated cost.

NOTE 2

Land and buildings are stated in the accounts as follows:

Land and buildings acquired prior to 1921: at appraised values determined by the Washington Real Estate Board in June 1921.

Medical School property: at appraised value determined by Board of Trustees in August 1935.

All other land and buildings: at cost or appraised values at dates of acquisition.

Equipment is carried in the accounts as follows:

Hospital and Cancer Clinic equipment: at cost less accumulated depreciation to date.

All other equipment: at cost less accumulated depreciation to August 1938.

NOTE 3

For the year ended August 31, 1960, Hospital income includes income of the Departments of Anesthesiology, Laboratories and Radiology after there has been transferred from it to the Medical Sciences Fund the amount of \$574,036. This amount represents net income of these departments. In prior years before the Medical Sciences Fund was established, such net income would have been included with Hospital income. The Medical Sciences Fund has been charged with the deficits incurred in the operation of the Hospital and School of Medicine (\$112,635 and \$159,379 respectively) leaving a balance at August 31, 1960, of \$302,022.

In addition, the University's designated funds include \$497,748 received from the United States Government for use in research projects, principally by the School of Medicine and the Cancer Clinic. The balance of the designated funds was received, for the most part, from charitable organizations and foundations for research and other uses of the University's schools and departments and to finance student aid.

NOTE 4

Unexpended plant funds at August 31, 1960, are designated for the following uses:

Hospital Building	285,232.62
Law Center Building	160,697.36
Other	75,862.54
	<u>521,792.52</u>

During the year ended August 31, 1960, the Board of Trustees authorized the borrowing of up to \$1,000,000 to provide for the acquisition of real estate. Pursuant to this authorization \$500,000 was borrowed from the Riggs National Bank on August 31, 1960, to provide for the temporary financing of certain real estate which had been acquired prior to that time. The temporary loans were repaid from current funds by September 14, 1960; however, it may be necessary to provide for the permanent financing of these acquisitions through the medium of mortgage loans and the Board authorization referred to above provides for such action.

NOTE 6

Trust notes payable consisted of the following:

Riggs National Bank	
Secured by School of Medicine Buildings. Due February 21, 1965. Interest $5\frac{1}{2}\%$	350,000
Secured by Corcoran Hall and Stockton Hall. Due October 30, 1960. Interest $5\frac{1}{2}\%$	300,000
	<u>650,000</u>
Equitable Life Assurance Society	
Secured by Nurses Home. \$2,958 payable quarterly, including interest at 5%. Balance of note due November 1, 1961	129,757
Perpetual Building Association	
Secured by property at 2001 H Street, NW. Due \$675 per month including interest at 5%	65,597
Rose S. Bildman	
Secured by property at 2129-31 H Street, NW. Due \$1,800 each February and August 19. Interest 5%	17,100
Lillie J. Mulineaux and Adelaide A. Butler	
Secured by property at 729 22nd Street, NW. Due December 1, 1969. Interest 5%	12,000
John J. Kelliher	
Secured by property at 900 23rd Street, NW. Due \$300 per month including interest at 5%	10,314
	<u>884,768</u>

NOTE 7

These bonds, "The George Washington University Dormitory Bonds of 1957", bear interest of $2\frac{7}{8}\%$ per annum and mature serially during the period November 1, 1960, through November 1, 1997. The bonds are secured by first mortgages on Madison and Adams Halls and their sites and a first lien on and pledge of the net revenues of the Halls and the University bookstores. The University is required to transfer \$38,000 semi-annually to a Bond and Interest Sinking Fund Account until the balance in the account amount on deposit would be \$115,000 plus an amount equal to the required debt retirement for the next year. Pursuant to the above-mentioned requirements, \$92,612.78 was on deposit with the Bond Trustee at August 31, 1960.

SUMMARY OF DESIGNATED FUNDS

For the Year Ended August 31, 1960

	TOTAL	SPONSORED RESEARCH (Schedule 10)	INVESTMENT INCOME (Schedule 10A)	MISCEL- LANEOUS (Schedule 10B)	AGENCY (Schedule 10C)
BALANCE AUGUST 31, 1959.....	1,509,217.82	716,403.80	102,735.27	465,472.97	224,605.78
ADDITIONS					
Gifts and grants.....	.....	4,463,243.53	.....	424,460.88	.....
Investment income.....	.....	.....	392,169.38	7,596.25	.....
Deposits.....	.....	.....	.....	576,475.19	50,491.14
	5,914,436.37	4,463,243.53	392,169.38	1,008,532.32	50,491.14
DEDUCTIONS					
Research.....	.....	4,275,409.16	11,571.00	89,210.87	.....
Scholarships, fellowships.....	.....	.....	1,950.25	490.00	.....
Prizes.....	.....	.....	.....	.....	.....
Transferred to.....	.....	.....	.....	.....	.....
Surplus—Exhibit C.....	.....	.....	.....	272,013.56	.....
Net Investment in Plant—Exhibit H.....	.....	.....	.....	.....	.....
Current Income—Schedule 1.....	.....	.....	.....	.....	.....
Educational and General—Unrestricted.....	.....	.....	3,836.90	.....	.....
Designated.....	.....	.....	.....	.....	.....
Hospital.....	.....	.....	44,793.16	27,272.33	.....
Sponsored Research—Schedule 10.....	.....	.....	285,531.78	267,719.00	.....
Designated Funds—Miscellaneous—Schedule 10B.....	.....	.....	9,755.00	61,905.67	.....
Agency—Schedule 10C.....	.....	.....	54.77	.....	.....
Loan Funds—Schedule 11.....	.....	.....	7,596.25	.....	130.00
Endowment Funds—Schedule 12.....	.....	.....	200.13	220.00	.....
Plant Funds—Schedule 13.....	.....	.....	2,376.03	360.00	.....
Withdrawals.....	.....	.....	14,538.71	2,837.00	.....
	.....	.....	.....	.....	266,628.07
BALANCE AUGUST 31, 1960—EXHIBIT A.....	5,646,399.64	4,275,409.16	382,203.98	722,158.43	266,628.07
	1,777,254.55	904,238.17	112,700.67	751,846.86	8,468.85

SUMMARY OF LOAN FUNDS PRINCIPAL

For the Year Ended August 31, 1960

BALANCE AUGUST 31, 1959.....	115,536.31
ADDITIONS (Schedule 11)	
Gifts.....	
Interest on loans.....	11,099.10
Investment income.....	713.40
University Surplus.....	200.13
U. S. Government.....	900.44
	<u>95,452.00</u>
BALANCE AUGUST 31, 1960—EXHIBIT A.....	<u>108,365.07</u>
	<u>223,901.38</u>

EXHIBIT E

SUMMARY OF ENDOWMENT FUNDS PRINCIPAL

For the Year Ended August 31, 1960

BALANCE AUGUST 31, 1959.....	7,240,496.25
ADDITIONS (Schedule 12)	
Gifts.....	274,386.76
Investment income.....	2,376.03
Net gain on sale of investments.....	12,929.23
	<u>289,692.02</u>
BALANCE AUGUST 31, 1960—EXHIBIT A.....	<u>7,530,188.27</u>

SUMMARY OF PLANT FUNDS PRINCIPAL

For the Year Ended August 31, 1960

BALANCE AUGUST 31, 1959.....	513,770.56
ADDITIONS (Schedule 13)	
Gifts.....	
Investment income.....	46,503.10
Transferred from Surplus—Exhibit C.....	14,538.71
Gain on sale of investments.....	1,010.64
	<u>3,581.72</u>
	65,634.17
	<u>579,404.73</u>
DEDUCTIONS (Schedule 13)	
Invested in Plant—Exhibit H	
Land and Buildings.....	50,205.45
Equipment.....	<u>7,406.76</u>
	57,612.21
BALANCE AUGUST 31, 1960—EXHIBIT A.....	<u><u>521,792.52</u></u>

EXHIBIT G

SUMMARY OF NET INVESTMENT IN PLANT For the Year Ended August 31, 1960

	CURRENT FUNDS		DESIGNATED FUNDS (Exhibit D)	PLANT FUNDS (Exhibit G)	Total
	DEPARTMENTS (Schedule 2)	SURPLUS (Exhibit C)			
BALANCE AUGUST 31, 1959.....					21,988,603.51
ADDITIONS					
University					
Land and Buildings.....	.....	367,216.18	.....	44,205.45	
Equipment.....	159,724.17	47,072.74	926.90	910.75	
Trust Notes Curtailed.....	.....	13,774.09	.....	.....
	<u>159,724.17</u>	<u>428,063.01</u>	<u>926.90</u>	<u>45,116.20</u>	
Hospital					
Land and Buildings.....	.....	37,207.26	.....	6,000.00	
Equipment.....	.....	151,073.61	.....	9,406.01	
		<u>188,280.87</u>	.....	<u>15,406.01</u>	
TOTAL ADDITIONS.....	<u>159,724.17</u>	<u>616,343.88</u>	<u>926.90</u>	<u>60,522.21</u>	
DEDUCTIONS					
Depreciation of Hospital Building and Equipment.....	.....	126,800.00			
TOTAL NET ADDITIONS.....	<u>159,724.17</u>	<u>489,543.88</u>	<u>926.90</u>	<u>60,522.21</u>	710,717.16
BALANCE AUGUST 31, 1960—EXHIBIT A.....					<u>22,699,320.67</u>

SCHEDULES

1. General	100,000.00	100,000.00
2. Administration	100,000.00	100,000.00
3. Education	100,000.00	100,000.00
4. Health	100,000.00	100,000.00
5. Social Services	100,000.00	100,000.00
6. Economic Development	100,000.00	100,000.00
7. Culture and Recreation	100,000.00	100,000.00
8. Environment	100,000.00	100,000.00
9. Transportation	100,000.00	100,000.00
10. Housing	100,000.00	100,000.00
11. Public Works	100,000.00	100,000.00
12. Safety	100,000.00	100,000.00
13. Miscellaneous	100,000.00	100,000.00
Total	1,000,000.00	1,000,000.00

For the year ending 31st March 1960
 COUNCIL REVENUE

EDUCATION AND CEMENT

CURRENT INCOME
For the Year Ended August 31, 1960

EDUCATIONAL AND GENERAL

STUDENT FEES—TUITION AND LABORATORY

Columbian College.....	465,395.57
Counselling and Guidance Training Institute—1.....	2,254.28
2.....	32,417.10
Language Supervision Seminar.....	11,384.68
National Science Foundation—In-Service Training.....	3,321.32
Summer Math.....	45,987.02
Education.....	228,448.43
Engineering.....	351,906.29
Naval Academy Instruction Program.....	5,138.00
Welded Steel Structure.....	1,150.00
General Studies.....	525,056.02
Government.....	229,184.70
Air Force Advanced Management.....	50,637.00
International Cooperation Administration—Austrian I.....	(-475.00)
T. A. I. Program.....	250.00
Internal Revenue Service Training.....	9,450.00
Navy Comptrollership.....	40,123.08
Special Lectures.....	1,572.50
Graduate Council.....	59,697.68
National Defense Graduate Fellowship.....	20,000.00
Junior.....	894,551.73
Law.....	467,844.62
Institute of Forensic Medicine.....	1,390.00
Medicine.....	391,760.75
Post-Graduate Medical Education.....	644.40
Pharmacy.....	23,754.67
Special Students.....	190,857.17
University Students.....	321,849.02
	<hr/>
	4,375,551.03

Summer Sessions.....	441,194.62
Unallocated—Old Fees.....	2,716.17
STUDENT FEES—MISCELLANEOUS	4,819,461.82

Application.....	89,710.98
Art Validation.....	75.00
Binding Theses.....	1,140.00
Breakage.....	1,165.25
Change.....	3,282.00
Engineers Council.....	3,240.00
Graduation.....	40,299.50
Graduate Record.....	3,894.00
Late.....	3,035.00
Library Fines.....	3,968.79
Publication of Theses.....	1,615.00
Reinstatement.....	2,945.00
Service.....	4,619.00
Special Examinations.....	240.00
Student Bar Association.....	6,456.00
Testing Center.....	20,442.36
Transfers.....	586.00
Transcripts.....	5,239.37
	191,953.25
	5,011,415.07

CURRENT INCOME (Continued)

For the Year Ended August 31, 1960

EDUCATIONAL AND GENERAL (Continued)

INVESTMENT INCOME

Endowment Funds—Unrestricted.....	44,793.16	
" Restricted.....	284,622.84	
Plant Funds—Restricted.....		330,324.94
	329,416.00	
	<u>908.94</u>	

GIFTS

Unrestricted (Appendix—Page 1).....	42,721.92	
Restricted (Schedule 10B—portion used).....	267,719.00	310,440.92

STUDENT ACTIVITIES

Athletics.....	68,441.87	
Campus Combo.....	220.00	
Cherry Tree.....	9,856.27	
Colonial Boosters.....	440.00	
Dramatics.....	396.00	
Engineers Council.....	3,463.03	
Hatchet.....	9,581.30	
Homcoming.....	4,129.75	
Potomac Magazine.....	452.71	
Student Bar Association.....	1,679.00	
Student Council Activities.....	1,732.28	
Student Council Reserve.....	137.16	100,529.37

MISCELLANEOUS	
Handling Fee—Veterans Administration.....	10,409.33
Interest Earned.....	40,458.94
Law Review.....	10,547.98
Mechelectiv.....	1,104.55
Miscellaneous.....	8,782.18
Parking Lot—Hospital.....	34,438.50
“ Students.....	20,224.80
Reading Clinic.....	38,415.16
Rent on Miscellaneous Properties—Net.....	80,669.04
Speech Clinic.....	3,159.00
	<hr/>
	248,209.48

SPONSORED RESEARCH (Schedule 10—portion used).....	4,275,409.16
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CURRENT INCOME (Continued)
For the Year Ended August 31, 1960

EDUCATIONAL AND GENERAL (Continued)

HOSPITAL—Patients

Room Charges	
Private.....	668,870.00
Semi-Private.....	1,616,452.77
Wards.....	334,433.00
Nurseries.....	167,214.00
	<u>2,786,969.77</u>

Special Service Departments

Operating Room.....	306,426.27
Delivery Room.....	138,155.75
Anesthesiology.....	240,536.60
Oxygen Therapy.....	67,730.30
Radiology.....	259,142.52
Physical Medicine.....	91,810.50
Laboratories.....	346,682.80
Pharmacy.....	383,370.04
Cardiology.....	71,553.25
Electroencephalography.....	13,617.50
Post Anesthesia Room.....	37,189.00
	<u>1,956,014.53</u>

Cancer Clinic

General Services

Gifts.....	120,031.70
	<u>10,411.60</u>
	130,443.30

Out-Patient Departments

Clinics.....	93,476.63
Emergency Room.....	71,281.22
Ophthalmology.....	49.50
Surgery.....	5,629.05
Gynecology—Obstetrics.....	<u>2,913.25</u>
	173,349.65

Other Income

Medical and Surgical Supplies.....	189,437.10
Special Duty Nurses.....	16,192.49
Telephone.....	<u>17,674.39</u>

223,303.98 5,270,081.23 (Continued)

CURRENT INCOME (Continued)

For the Year Ended August 31, 1960

EDUCATIONAL AND GENERAL (Continued)

HOSPITAL—Patients (Continued).....	5,270,081.23
Less Allowances.....	
Group Hospitalization.....	60,714.37
Hospital Service Agency.....	10,088.25
D. C. Health Department.....	20,245.00
Discounts.....	42,058.95
Free Work.....	171,023.64
Other.....	5,874.05
Total—Hospital Patients.....	310,004.26
Total—Hospital Patients.....	4,960,076.97

HOSPITAL—Other Income

Cafeteria.....	137,282.24
Endowment Income (Schedule 10A).....	9,755.00
Gifts (Schedule 10B).....	61,905.67
“ —Other.....	4,685.90
Bad Debt Recovery.....	17,381.23
Laundry.....	1,159.80
Medical Abstracts.....	1,877.85
Parking Rent.....	440.00
Public Telephone Commissions.....	1,361.09
Miscellaneous.....	3,153.25
	239,002.03
	5,199,079.00

AUXILIARY ENTERPRISES

RESIDENCE HALLS

Adams Hall.....	51,618.60
Interns and Residents Hall.....	5,800.00
Madison Hall.....	66,326.23
Nurses Home.....	37,249.19
Strong Hall.....	36,503.48
Welling Hall.....	23,844.00
	<u>221,341.50</u>

SORORITY HALLS

2112 G Street, NW.....	1,350.00
2129 G Street, NW.....	5,067.00
2131 G Street, NW.....	780.00
802 21st Street, NW.....	630.00
	<u>7,827.00</u>

MISCELLANEOUS

Book Store—University.....	432,966.02
“ Medical School.....	55,789.71
Cafeteria Commissions.....	7,740.74
Duplicating Bureau.....	2,663.60
Lisner Auditorium.....	33,644.00
Student Union.....	1,398.00
	<u>534,202.07</u>
	<u>763,370.57</u>

TOTAL—EXHIBIT B..... 16,238,778.51

CURRENT EXPENSE For the Year Ended August 31, 1960

EDUCATIONAL AND GENERAL - ADMINISTRATION AND GENERAL	TOTAL	SALARIES	OTHER EXPENSE	EQUIPMENT EXHIBIT H
President's Office.....	49,318.33	28,816.93	20,501.40	
Administrative Secretary's Office.....	121,823.36	56,361.36	65,462.00	
Dean of Faculties' Office.....	37,680.03	37,217.15	462.88	
Treasurer's Office.....	426,899.80	296,253.46	130,062.96	583.38
Admissions Office.....	91,128.13	84,227.33	6,900.80	
Registrar's Office.....	93,959.97	76,549.00	17,410.97	
Activities for Men.....	7,226.69	6,634.51	592.18	
Activities for Women.....	19,820.36	18,789.74	1,030.62	
Adviser to Students from Foreign Countries.....	1,618.82	703.60	915.22	
University Chapels.....	5,479.02	3,295.96	2,183.06	
Veterans Education.....	15,617.61	15,118.13	499.48	
Counseling Center.....	23,620.63	21,239.54	2,381.09	
Staff Benefits.....	324,568.65	44,112.87	280,455.78	
Assistant to the President.....	29,890.19	20,160.96	9,729.23	
Alumni Relations.....	37,794.20	16,506.15	21,288.05	
Educational Counseling Office.....	31,156.57	22,444.99	8,711.38	
Fund Raising.....	32,918.42	19,254.71	13,663.71	
Public Relations Office.....	63,567.06	38,975.09	24,591.97	
Addressograph Office.....	9,140.74	7,676.83	1,463.91	
Convocations.....	22,712.33	1,087.40	21,624.93	
Scientific Activities.....	25,637.02	24,629.65	1,007.37	
Financial Expense.....	48,092.92		48,092.92	
General Insurance.....	9,061.59		9,061.59	
Legal Expense.....	11,059.92		11,059.92	
Curator of Art.....	1,299.19		1,299.19	
Health Administration.....	25,240.23	18,510.64	6,729.59	
	1,566,331.58	858,566.00	707,182.20	583.38

Administration.....	26,977.75	24,959.76	2,017.99	
Art.....	30,048.43	15,585.00	14,463.43	
Biology.....	21,482.52	15,600.00	5,721.62	160.90
Botany.....	17,635.36	13,608.00	3,463.66	563.70
Chemistry.....	103,695.85	86,468.96	16,537.29	689.60
Classical Languages and Literatures.....	4,215.00	4,200.00	15.00	
Economics.....	53,177.98	46,165.00	7,012.98	
English.....	101,590.01	93,730.00	7,860.01	
Geography.....	22,480.77	20,000.00	2,086.62	394.15
Geology.....	23,005.34	16,740.00	6,265.34	
Germanic Languages.....	24,548.37	24,100.00	75.37	373.00
Graduate Fellowships.....	133.66	53.75	79.91	
History.....	53,112.33	49,550.00	3,562.33	
Journalism.....	16,275.76	16,250.00	25.76	
Mathematics.....	102,074.68	66,665.03	35,409.65	
Philosophy.....	12,422.01	12,400.00	22.01	
Physics.....	60,153.75	49,442.51	9,327.83	1,383.41
Political Science.....	38,915.21	35,435.00	3,480.21	
Psychology.....	63,328.93	57,513.22	4,251.14	1,564.57
Counseling and Guidance Institute.....	29,855.33	6,289.75	23,565.58	
Religion.....	23,584.66	23,499.88	84.78	
Romance Languages.....	69,557.79	69,119.22	304.07	134.50
Graduate Fellowships.....	25,213.20	13,282.92	11,830.28	100.00
Language Workshop.....	4,945.19	4,183.17	762.02	
Secretarial Studies.....	8,849.10	7,950.00	399.90	499.20
Research Study.....	7,028.68	5,640.00	1,388.68	
Slavic Languages.....	14,449.57	14,395.00	54.57	
Sociology.....	19,760.94	19,720.00	40.94	
Speech.....	40,352.71	36,207.62	3,995.09	150.00
Statistics.....	40,218.72	35,135.00	3,758.88	1,324.84
Zoology.....	28,519.55	25,085.00	2,985.85	448.70
	<u>1,087,609.15</u>	<u>908,973.79</u>	<u>170,848.79</u>	<u>7,786.57</u>

CURRENT EXPENSE (Continued)
For the Year Ended August 31, 1960

	Total	SALARIES	OTHER EXPENSE	EQUIPMENT EXHIBIT H
EDUCATIONAL AND GENERAL (Continued)				
INSTRUCTION AND DEPARTMENTAL RESEARCH (Continued)				
Education				
Administration.....	23,900.69	22,717.77	1,182.92	
Education.....	66,106.82	60,080.21	6,026.61	
Home Economics.....	16,189.19	14,475.00	1,714.19	
	<u>106,196.70</u>	<u>97,272.98</u>	<u>8,923.72</u>	
Engineering				
Administration.....	52,617.60	42,692.39	9,925.21	3,349.61
Civil.....	43,178.77	35,860.00	3,969.16	5,835.62
Electrical.....	59,029.03	50,585.00	2,608.41	3,397.05
Mechanical.....	49,106.75	42,577.61	3,132.09	450.00
Engineering Administration.....	45,591.80	44,705.00	436.80	137.35
Introductory Astronomy.....	857.85	700.00	20.50	
Naval Academy Program.....	3,220.00	3,220.00		
Engineers Council.....	5,320.18		5,320.18	
Mecheleci.....	2,487.50		2,487.50	
	<u>261,409.48</u>	<u>220,340.00</u>	<u>27,899.85</u>	<u>13,169.63</u>
General Studies				
Administration.....	104,346.06	87,475.79	16,870.27	
Instruction.....	200,924.00	200,924.00		
Reading Clinic.....	25,990.78	24,789.09	790.28	411.41
Telecourses.....	22,037.63	4,870.90	17,166.73	
	<u>353,298.47</u>	<u>318,059.78</u>	<u>34,827.28</u>	<u>411.41</u>

Government

Administration.....	40,283.80	37,010.96	3,272.84
Accounting.....	35,080.02	34,880.00	200.02
Business Administration.....	65,294.31	62,670.00	2,624.31
Public Administration.....	24,924.96	23,270.00	1,654.96
Navy Comptrollership.....	24,032.87	20,440.77	3,125.28
Air Force Advanced Management.....	26,443.50	22,620.75	3,451.16
Internal Revenue Service Training.....	4,703.40	2,960.00	1,743.40
Special Lecture Series.....	1,667.23	.....	1,667.23
	<u>222,430.09</u>	<u>203,852.48</u>	<u>17,739.20</u>
			<u>838.41</u>

Graduate Council

Administration.....	22,867.52	20,354.84	2,512.68
Instruction.....	5,151.90	1,060.13	1,933.88
	<u>28,019.42</u>	<u>21,414.97</u>	<u>4,446.56</u>
			<u>2,157.89</u>

Junior College—Administration.....

	<u>23,777.58</u>	<u>22,919.39</u>	<u>858.19</u>
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Law

Administration.....	36,908.91	29,769.51	7,139.40
Instruction.....	202,226.14	187,750.14	14,476.00
Law Center Administration.....	18,062.11	17,167.00	895.11
Forensic Medicine Institute.....	4,430.39	3,333.30	1,097.09
Patent, Trademark and Copyright Foundation.....	82,649.11	67,158.44	15,490.67
Law Review.....	21,451.56	3,113.20	18,338.36
Student Bar Association.....	4,438.58	.....	4,438.58
	<u>370,166.80</u>	<u>308,291.59</u>	<u>61,875.21</u>

CURRENT EXPENSE (Continued)
For the Year Ended August 31, 1960

EDUCATIONAL AND GENERAL (Continued)				
INSTRUCTION AND DEPARTMENTAL RESEARCH (Continued)				
	TOTAL	SALARIES	OTHER EXPENSE	EQUIPMENT EXHIBIT H
Medicine				
Administration	80,849.16	71,863.91	5,695.35	3,289.90
Anatomy	61,720.33	52,699.68	5,149.89	3,870.76
Anesthesiology	1,256.66	1,166.66	90.00	
Bacteriology, Hygiene, Preventive Medicine	63,088.54	55,952.02	4,127.74	3,008.78
Biochemistry	55,836.54	46,618.39	7,361.35	1,856.80
Dermatology, Syphilology	1,450.00	1,450.00		
Medicine	78,508.62	62,723.45	15,383.06	402.11
Neurology, Neurological Surgery	8,965.68	6,999.92	1,724.20	241.56
Obstetrics, Gynecology	32,993.06	32,199.76	793.30	
Ophthalmology	1,310.50	1,225.00	85.50	
Otolaryngology	1,500.00	1,450.00	50.00	
Pathology	41,874.80	39,830.22	1,562.52	482.06
Pediatrics	17,188.07	16,929.88	258.19	
Pharmacology	44,084.62	39,729.80	4,047.48	307.34
Physical Medicine, Rehabilitation	3,373.33	3,099.96	124.47	148.90
Physiology	71,865.55	62,039.88	5,411.16	4,414.51
Psychiatry	16,304.26	16,107.11	197.15	
Surgery	42,843.36	40,099.92	2,743.44	
Urology	1,550.00	1,550.00		
Research—General	16,547.71	8,431.23	3,336.63	4,779.85
Teaching Aids	6,054.72	5,599.92	454.80	
Lecturers and Exchange Professors	747.75	720.00	27.75	
Post-Graduate Medical Education	644.40		644.40	
	650,557.66	568,486.71	59,268.38	22,802.57

Pharmacy—Administration.....	13,221.71	12,540.00	681.71
" Instruction.....	31,980.82	29,309.88	2,185.50
	<u>45,202.53</u>	<u>41,849.88</u>	<u>2,867.21</u>
			<u>485.44</u>
			<u>485.44</u>
Special—Administration.....	18,467.96	18,234.95	233.01
University—Administration.....	28,023.54	27,230.31	793.23
Summer Sessions—Administration.....	14,609.37	10,344.86	4,264.51
" Instruction.....	145,213.64	140,898.33	4,315.31
	<u>159,823.01</u>	<u>151,243.19</u>	<u>8,579.82</u>
Physical Education—Men.....	44,846.17	33,749.37	11,096.80
" Women.....	54,066.60	47,279.97	6,786.63
	<u>98,912.77</u>	<u>81,029.34</u>	<u>17,883.43</u>
Air Science—R. O. T. C.....	7,046.17	4,598.75	2,447.42
TOTAL INSTRUCTION AND DEPARTMENTAL RESEARCH.....	<u>3,460,941.33</u>	<u>2,993,798.11</u>	<u>419,491.30</u>
			<u>47,651.92</u>

CURRENT EXPENSE (Continued)
For the Year Ended August 31, 1960

EDUCATIONAL AND GENERAL (Continued)	TOTAL	SALARIES	OTHER EXPENSE	EQUIPMENT EXHIBIT H
LIBRARIES—Operation.....	139,776.19	123,258.67	15,719.38	798.14
<u> a </u>	61,186.89	.....	.....	61,186.89
Books.....	200,963.08	123,258.67	15,719.38	61,985.03
	<u>720,401.98</u>	<u>358,921.55</u>	<u>312,106.59</u>	<u>49,373.84</u>
MAINTENANCE AND OPERATION OF PLANT.....				
STUDENT ACTIVITIES				
Men's Athletics.....	158,858.51	65,896.18	92,962.33	
Dramatics.....	9,574.76	5,245.00	4,329.76	
Recreation Program.....	2,636.55	1,019.22	1,617.33	
Student Activities Office.....	5,164.53	3,335.74	1,828.79	
University Accounts.....	6,473.72	2,749.92	3,723.80	
Student Council Accounts.....	34,938.04	400.00	34,538.04	
Homecoming.....	1,200.00	100.00	1,100.00	
	<u>218,866.11</u>	<u>78,746.06</u>	<u>140,120.05</u>	
SPONSORED RESEARCH.....	4,275,409.16	2,816,980.79	1,458,428.37	

HOSPITAL

Administration..... 529,168.91 226,898.91 302,270.00

Dietary..... 594,186.64 297,672.68 296,513.96

HOUSEHOLD AND PROPERTY

Laundry..... 96,805.28 92,733.92 4,071.36
 Linen Service..... 53,427.88 17,808.81 35,619.07
 Housekeeping..... 248,162.58 195,421.33 52,741.25
 Plant..... 316,134.93 108,681.18 207,453.75
 714,530.67 414,645.24 299,885.43

PROFESSIONAL CARE—GENERAL

Medical and Surgical..... 133,811.75 106,664.09 27,147.66
 Nursing Care..... 1,243,878.34 1,178,941.45 64,936.89
 Central Sterile Supply..... 106,372.15 37,385.74 68,986.41
 Glove Room..... 22,463.27 7,397.93 15,065.34
 1,506,525.51 1,330,389.21 176,136.30

CURRENT EXPENSE (Continued)
For the Year Ended August 31, 1960

EDUCATIONAL AND GENERAL (Continued)	TOTAL	SALARIES	OTHER EXPENSE	EQUIPMENT EXHIBIT H
HOSPITAL (Continued)				
Professional Care—Special	20,714.04	20,714.04		
Post Anesthesia Room.....	215,767.96	145,237.19	70,530.77	
Operating Room.....	110,923.98	97,559.79	13,364.19	
Delivery Room.....	199,490.45	139,185.25	60,305.20	
Anesthesiology.....	25,830.92	14,084.72	11,746.20	
Inhalation Therapy.....	23,190.99	17,559.10	5,631.89	
Cardiology Heart Station.....	7,521.82	6,728.17	793.65	
Electroencephalography.....	256,438.39	151,333.73	105,104.66	
Laboratories.....	186,459.43	34,817.43	151,642.00	
Pharmacy.....	62,898.16	60,599.87	2,298.29	
Physical Medicine.....	192,341.89	139,880.85	52,461.04	
X-Ray.....	81,806.06	68,593.73	13,212.33	
Medical Records.....	3,369.12	1,426.66	1,942.46	
Medical Library for Residents and Interns.....	1,386,753.21	897,720.53	489,032.68	
Out-Patient Department				
Administration.....	62,818.78	38,932.66	23,886.12	
Nursing Care.....	42,542.38	42,542.38		
Emergency Room.....	37,128.21	27,850.50	9,277.71	
	142,489.37	109,325.54	33,163.83	

Cancer Clinic			
Administration.....	50,727.33	33,960.10	16,767.23
Medical and Surgical.....	64,642.72	34,262.55	30,380.17
Radioisotope Laboratory.....	5,969.26	3,537.08	2,432.18
Housekeeping, Plant.....	25,120.13	8,921.80	16,198.33
Overhead Credit—Research.....	(-17,989.12)	.....	(-17,989.12)
Depreciation—Equipment.....	4,500.00	.....	4,500.00
	<u>132,970.32</u>	<u>80,681.53</u>	<u>52,288.79</u>
Respiratory and Rehabilitation Center			
Administration.....	49,607.78	41,112.93	8,494.85
Nursing Care.....	8,637.89	.....	8,637.89
	<u>58,245.67</u>	<u>41,112.93</u>	<u>17,132.74</u>
Miscellaneous			
Ambulance Service.....	95.00	.....	95.00
Scholarships.....	8,058.00	.....	8,058.00
Incentive Awards.....	1,031.00	.....	1,031.00
Nurses Home.....	15,000.00	.....	15,000.00
Residents and Interns Room Charges.....	4,890.69	.....	4,890.69
Allowance for Doubtful Accounts.....	95,468.98	.....	95,468.98
Depreciation—Building.....	60,000.00	.....	60,000.00
“ Equipment.....	62,300.00	.....	62,300.00
	<u>246,843.67</u>	<u>.....</u>	<u>246,843.67</u>
TOTAL HOSPITAL.....	<u>5,311,713.97</u>	<u>3,398,446.57</u>	<u>1,913,267.40</u>

CURRENT EXPENSE (Continued)
For the Year Ended August 31, 1960

AUXILIARY ENTERPRISES

RESIDENCE HALLS

	TOTAL	SALARIES	OTHER EXPENSE	EQUIPMENT EXHIBIT H
Adams Hall.....	39,520.72	9,753.29	29,767.43	
Intens and Residents Hall.....	2,026.80	.....	2,026.80	
Madison Hall.....	66,727.29	20,235.27	46,492.02	
Nurses Home.....	1,658.80	.....	1,658.80	
Strong Hall.....	45,058.74	15,883.51	29,175.23	
Welling Hall.....	16,347.09	5,975.54	10,371.55	
	<u>171,339.44</u>	<u>51,847.61</u>	<u>119,491.83</u>	

SORORITY HALLS

2112 G Street, NW.....	2,570.14	.....	2,570.14	
2129 G Street, NW.....	4,223.12	.....	4,223.12	
2131 G Street, NW.....	975.27	200.00	775.27	
802 21st Street, NW.....	603.80	.....	603.80	
	<u>8,372.33</u>	<u>200.00</u>	<u>8,172.33</u>	

SERVICES

Book Store—University.....	411,200.55	46,309.44	364,761.11	130.00
" Medical School.....	52,847.09	5,366.54	47,480.55	
Duplicating Bureau.....	3,371.22	1,411.05	1,960.17	
Lisner Auditorium.....	32,596.39	15,175.02	17,421.37	
Student Union.....	34,863.80	16,993.96	17,869.84	
	<u>534,879.05</u>	<u>85,256.01</u>	<u>449,493.04</u>	<u>130.00</u>

TOTAL AUXILIARY ENTERPRISES.....

577,157.20

130.00

STUDENT AID

SCHOLARSHIPS.....	97,858.31	2,508.38	95,350.26
GRANTS-IN-AID.....	146,240.21	.....	146,240.21
	<u>244,098.85</u>	<u>2,508.38</u>	<u>241,590.47</u>
TOTAL EXPENSE.....	16,713,316.88	10,768,529.75	5,785,062.96
			<u>159,724.17</u>
Less overhead allocated to Sponsored Research and Hospital.....	<u>527,371.73</u>		
TOTAL EXPENSE—ADJUSTED—EXHIBIT B.....	<u>16,185,945.15</u>		

INVESTMENTS OF CURRENT FUNDS

August 31, 1960

	DESCRIPTION	%	DUE	VALUE	
				PAR	MARKET
BONDS					BOOK
	Development Issue.....	4	1969	1,000	1,000.00
State of Israel.....		2 1/8	1960	25,000	24,950.00
United States of America.....	Treasury.....	2 1/4	1959-62	60,000	59,160.00
"	Treasury.....	2 1/4	1959-62	20,000	19,640.00
"	Treasury.....	2 1/4	1963	50,000	48,900.00
"	Treasury.....	2 1/2	1961	80,000	79,760.00
"	Treasury.....	2 3/4	1963	38,000	39,596.00
"	Notes.....	4 7/8	1964	27,000	28,458.00
"	Notes.....	5			301,464.00
					300,000.00

STOCK—COMMON	SHARES	
Koppers Co., Inc.....	215	8,600.00 9,857.50

CERTIFICATES OF INTEREST.....	1,395	1.00
Texas American Syndicate.....		310,065.00
		309,858.50

TRUST NOTES RECEIVABLE		69,862.37
N. Papanicolas—Secured by 1225 New York Avenue, NW. Due June 17, 1962. Interest 5%. Exhibit A.....		

ASSETS OF LOAN FUNDS

August 31, 1960

FUNDS	TOTAL	CASH	LOANS RECEIVABLE
Himes.....	17,542.19	1,964.40	15,577.79
Home Economics.....	382.35	382.35	
Kellogg Hospital Administration.....	10,000.00	10,000.00	
Kellogg School of Medicine.....	20,946.68	1,225.47	19,721.21
Law Association.....	2,620.27	1,353.86	1,266.41
National Defense.....	150,925.13	65,988.53	84,936.60
Pfizer.....	1,055.03	255.03	800.00
Schoenfeld.....	2,155.47	917.80	1,237.67
School of Medicine.....	16,636.30	2,767.61	13,868.69
Sutherland.....	1,637.96	887.96	750.00
TOTALS—EXHIBIT A.....	223,901.38	85,743.01	138,158.37

ASSETS OF ENDOWMENT FUNDS

August 31, 1960

CONSOLIDATED ENDOWMENT FUNDS

	DESCRIPTION	%	DUE	VALUE		
				PAR	MARKET	BOOK
BONDS						
American Telephone and Telegraph Co.	Debenture.....	3 7/8	1990	53,000	49,820	54,200.00
"	Debenture.....	5	1983	50,000	53,000	50,500.00
"	Debenture.....	5 3/8	1986	50,000	53,500	51,000.00
	General Mortgage.....	4	1995	2,000	1,900	2,000.00
Atchison, Topeka and Santa Fe Ry. Co.	Debenture.....	5	1977	50,000	52,000	48,800.00
Beneficial Finance Co.	First Mortgage D.....	3 1/8	1982	30,000	24,900	30,200.00
Boston Edison Co.	First Mortgage F.....	4 5/8	1987	50,000	50,000	50,500.00
"	First and General Mortgage W	4 7/8	1987	49,000	48,510	48,200.00
Central Maine Power Co.	Debenture.....	3 5/8	1970	35,000	33,250	34,800.00
C. I. T. Financial Corp.	Notes.....	4 1/4	1974	35,000	34,650	34,700.00
Commercial Credit Co.	First Mortgage R.....	3 1/2	1986	50,000	42,500	49,700.00
Commonwealth Edison Co.	First and Refunding Mortgage L	3 5/8	1986	50,000	45,500	50,000.00
Consolidated Edison Co. of N. Y.	Debenture.....	4 7/8	1982	50,000	51,000	50,300.00
Consolidated Natural Gas Co.	First Mortgage.....	3 1/4	1987	30,000	23,700	30,500.00
Consumers Power Co.	Convertible Subordinate Deb...	3	1982	15,000	28,200	15,000.00
Dow Chemical Co.	Notes.....	3 1/8	1963	100,000	98,800	100,000.00
Federal Home Loan Banks.....	Consolidated Farm Loan.....	4 1/8	1967-72	50,000	49,850	50,000.00
Federal Land Banks.....	"	4 5/8	1969	100,000	102,700	100,000.00

Florida Power and Light Co.....	First Mortgage.....	45%	1987	50,000	48,500	50,800.00
General Electric Co.....	Debenture.....	3 1/2	1976	50,000	47,000	50,000.00
General Motors Acceptance Corp.....	Debenture.....	3 1/2	1972	40,000	36,800	40,000.00
General Telephone Co. of California.....	First Mortgage K.....	5	1987	50,000	50,500	50,000.00
Georgia Power Co.....	First Mortgage.....	5 1/4	1987	36,000	37,440	36,600.00
Great Northern Railway Co.....	General Mortgage D.....	4 1/2	1976	25,000	25,000	25,000.00
Illinois Bell Telephone Co.....	First Mortgage A.....	2 3/4	1981	30,000	24,000	28,500.00
International Bank for Rec. and Dev.....	Twenty-one years.....	4 1/4	1978	34,000	33,660	33,600.00
Interstate Power Co.....	Twenty years.....	4 1/2	1977	50,000	50,500	50,000.00
Metropolitan Edison Co.....	First Mortgage.....	5	1987	50,000	51,000	50,000.00
National Fuel Gas Co.....	First Mortgage.....	4 7/8	1987	50,000	49,000	50,500.00
New Jersey Bell Telephone Co.....	Sinking Fund Debenture.....	5 1/2	1982	15,000	15,600	15,000.00
New York Central Railroad Co.....	Debenture.....	3 1/8	1988	25,000	20,500	25,000.00
New York State Electric and Gas Corp..	Refunding and Improvement A.....	4 1/2	2013	30,000	18,600	25,300.00
New York Telephone Co.....	First Mortgage.....	4 5/8	1987	50,000	50,000	50,500.00
Northern Natural Gas Co.....	Refunding Mortgage J.....	4 1/2	1991	50,000	50,500	50,600.00
Northern States Power Co.....	Sinking Fund Debenture.....	4 1/2	1976	50,000	49,000	50,000.00
Northwestern Bell Telephone Co.....	First Mortgage.....	4 5/8	1987	49,000	49,000	49,000.00
Pacific Gas and Electric Co.....	Debenture.....	4 3/8	1989	50,000	48,000	50,200.00
Pacific Telephone and Telegraph Co....	First and Refunding Mortgage BB.....	5	1989	50,000	53,000	50,200.00
Pennsylvania Railroad Co.....	Debenture.....	5 1/8	1980	50,000	52,500	51,000.00
	General Mortgage E.....	4 1/4	1984	25,000	18,750	26,000.00

ASSETS OF ENDOWMENT FUNDS (Continued)

August 31, 1960

CONSOLIDATED ENDOWMENT FUNDS (Continued)

Bonds (Continued)	DESCRIPTION	%	DUE	VALUE	
				MARKET	BOOK
Potomac Edison Co.....	First Mortgage Collateral Trust.	4½%	1987	47,500	48,700.00
Potomac Electric Power Co.....	First Mortgage.....	3¾%	1991	32,800	39,800.00
Procter and Gamble Co.....	Debenture.....	3¾%	1981	33,950	35,000.00
Public Service Company of Colorado....	First Mortgage.....	4¾%	1987	47,000	50,000.00
Public Service Electric and Gas Co.....	First and Refunding Mortgage.	4¾%	1986	47,500	50,400.00
R. J. Reynolds Tobacco Co.....	Debenture.....	3	1973	25,500	30,000.00
Sears Roebuck Acceptance Corp.....	Debenture.....	4½%	1972	51,000	49,900.00
Sears Roebuck and Co.....	Sinking Fund Debenture.....	4¾%	1983	104,000	100,000.00
Service Pipe Line Co.....	Sinking Fund Debenture.....	3.20	1982	21,500	25,000.00
Southern Bell Telephone and Telegraph Co.	Debenture.....	5	1986	52,500	50,900.00
Southern California Gas Co.....	First Mortgage C.....	5½%	1983	49,920	48,700.00
Southern Railway Co.....	First Consolidated Mortgage...	5	1994	1,040	1,000.00
State Loan and Finance Corp.....	Sinking Fund Debenture.....	3¾%	1966	4,700	5,000.00
State Loan and Finance Corp.....	Sinking Fund Debenture Reg..	5.40	1980	10,100	10,000.00
Tennessee Gas Transmission Co.....	Sinking Fund Sub. Deb. Reg..	5¾%	1978	19,400	20,000.00
United Gas Corp.....	Debenture.....	4¼%	1974	24,000	24,200.00
United Gas Corp.....	First Mortgage Pipe Line.....	4¾%	1976	23,760	24,000.00
United Gas Corp.....	Sinking Fund Debenture.....	4¾%	1972	17,460	18,100.00
United Gas Corp.....	First Mortgage Collateral Trust.	4½%	1977	47,520	48,400.00

United States of America.....	Treasury.....	2¼	1959-62	30,000	29,550	30,000.00
"	Treasury.....	2½	1961	56,000	55,608	56,000.00
"	Treasury.....	2½	1967-72	8,000	7,080	8,000.00
"	Treasury.....	2½	1965	20,000	19,320	20,000.00
"	Treasury B Reg.....	2½	1975-80	10,000	9,230	10,000.00
"	Treasury.....	3¼	1985	60,000	55,200	60,100.00
"	Treasury.....	4	1969	99,000	100,782	99,000.00
"	Treasury.....	4	1980	150,000	151,800	148,500.00
"	Treasury Notes.....	3½	1990	200,000	187,200	200,000.00
"	Treasury Notes.....	4	1961	256,000	258,048	256,000.00
"	Treasury Notes.....	4	1963	75,000	76,350	75,000.00
"	Certificates of Indebtedness.....	4⅞	1963	100,000	104,200	100,000.00
"	Certificates of Indebtedness.....	4⅞	1961	150,000	151,350	150,000.00
"	Certificates of Indebtedness.....	4¾	1960	50,000	50,200	50,000.00
Washington Gas Light Co.....	General Mortgage.....	5	1960	12,000	12,000	12,000.00
"	Refunding Mortgage.....	5	1982	51,000	52,020	51,000.00
Western Massachusetts Electric Co.....	First Mortgage C.....	4⅞	1987	50,000	49,500	50,000.00
West Shore Railroad Co.....	Guaranteed First Mortgage Reg.....	4	2361	26,000	15,340	22,900.00
Wisconsin Telephone Co.....	Debenture.....	4½	1992	50,000	50,000	50,400.00
				<u>3,816,638</u>	<u>3,886,200.00</u>	

ASSETS OF ENDOWMENT FUNDS (Continued)

August 31 1960

CONSOLIDATED ENDOWMENT FUNDS (Continued)

	DESCRIPTION	RATE OR %	SHARES	VALUE	
				MARKET	BOOK
STOCKS—PREFERRED					
American Smelting and Refining.....	Cumulative.....	7	120	17,160.00	17,496.70
Appalachian Electric Power Co.....	Cumulative.....	4.50	100	9,400.00	10,600.00
Atchison, Topeka and Santa Fe Ry. Co.....	Non-Cumulative.....	5	600	6,000.00	5,987.50
Cleveland and Pittsburgh Railroad Co..	Guaranteed.....	7	100	5,800.00	8,500.00
Connecticut Light and Power Co.....	Cumulative.....	\$2.20	400	18,000.00	21,008.32
Consolidated Edison Co. of New York..	Cumulative.....	\$5.00	300	30,600.00	32,386.17
Corning Glass Works.....	Cumulative.....	3.50	240	20,640.00	24,000.00
Detroit, Hillsdale & Southwestern R. R..	Guaranteed.....	4	163	9,291.00	10,432.00
General Motors Corporation.....	Cumulative.....	\$3.75	200	16,800.00	20,000.00
"	Cumulative.....	\$5.00	100	10,800.00	12,525.25
General Telephone Co. of Florida.....	Cumulative B, Par Value \$25.....	\$1.30	1,000	26,000.00	25,000.00
Genesco, Inc.....	Cumulative.....	\$3.50	50	3,700.00	5,180.00
Gold and Stock Telegraph Co.....	Guaranteed.....	6	100	19,000.00	11,700.00
Gulf Power Co.....	Cumulative.....	4.64	100	9,100.00	10,300.00

H. J. Heinz Co.....	Cumulative.....	3.65	200	16,800.00	20,550.00
International Harvester.....	Cumulative.....	7	100	14,700.00	18,204.43
May Department Stores Co.....	Cumulative.....	3.75	50	3,850.00	5,150.00
"	Cumulative.....	\$3.75	200	15,600.00	20,700.00
McCrory Corp.....	Cumulative Convertible.....	3.50	200	15,400.00	20,670.70
Merck and Co.....	Cumulative.....	\$3.50	105	8,820.00	10,497.50
Pacific Gas and Electric Co.....	Redeemable First Preferred, Par Value \$25.	4.80	1,000	24,500.00	27,250.00
Pacific Lighting Corporation.....	Cumulative Convertible.....	\$4.75	300	39,900.00	29,700.00
Panhandle Eastern Pipe Line.....	Cumulative.....	4	200	17,800.00	20,172.40
Pennsylvania Electric Co.....	Cumulative.....	3.70	200	15,000.00	20,500.00
Philadelphia Electric Co.....	Cumulative.....	3.80	100	8,300.00	10,270.00
Reynolds Metals Co.....	Second Convertible.....	4.50	225	26,100.00	22,500.00
R. J. Reynolds Tobacco Co.....	Cumulative.....	3.60	100	8,400.00	10,017.84
George A. Rogers and Co.....	Cumulative First.....	\$6.00	1	100.00	100.00
United States Steel Corporation.....	Cumulative.....	7	25	3,650.00	3,771.88
Virginia Electric and Power Co.....	Cumulative.....	\$4.04	300	25,500.00	30,681.00
				<u>446,711.00</u>	<u>485,851.69</u>

ASSETS OF ENDOWMENT FUNDS (Continued)

August 31, 1960

CONSOLIDATED ENDOWMENT FUNDS (Continued)

	SHARES	VALUE	
		MARKET	BOOK
Stocks—COMMON			
Allis-Chalmers Manufacturing Co.	1,000	27,000.00	21,347.00
Aluminum Co. of Canada, Ltd.	2,640	84,480.00	106,170.00
American Cyanamid Co.	600	31,200.00	22,252.44
American Electric Power Co.	1,127	63,112.00	13,587.71
American Home Products.	38	7,030.00	3,040.00
American Metal Climax, Inc.	1,627	37,421.00	45,334.94
American Security and Trust Co.	700	42,000.00	41,348.00
American Telephone and Telegraph Co.	1,236	117,420.00	65,361.70
American Tobacco Co.	100	6,000.00	4,971.88
Bethlehem Steel Corporation.	400	17,600.00	21,000.00
Chrysler Corporation.	220	9,460.00	12,947.75
Cincinnati Gas and Electric Co.	131	5,371.00	4,634.13
Cleveland Electric Illuminating Co.	50	2,750.00	2,462.50
Coca-Cola Company.	600	38,400.00	24,294.55
Columbian Carbon Co.	300	15,000.00	14,215.85
Commercial Credit Co.	500	33,000.00	20,163.14
Commonwealth Edison Co.	1,417	93,522.00	41,497.14
Consolidated Natural Gas Co.	500	24,500.00	25,051.39
Continental Can Co.	88	3,432.00	3,348.32
Continental Illinois National Bank and Trust Co. (Chicago)	449	51,186.00	16,893.78
Continental Insurance Co.	440	23,760.00	18,088.35
Continental Oil Co.	840	44,520.00	9,211.44

<i>duPont (E. I.) de Nemours</i>	106	20,776.00	15,688.25
<i>Eastman Kodak Co.</i>	694	86,056.00	13,241.52
<i>Firstamerica Corp.</i>	1,000	26,000.00	17,755.00
<i>First National City Bank (New York)</i>	228	17,100.00	14,678.95
<i>Ford Motor Co.</i>	500	32,500.00	32,250.00
<i>Garfinckel (Julius) & Co.</i>	412	11,948.00	11,124.00
<i>General American Transportation Corp.</i>	800	55,200.00	27,060.34
<i>General Electric Co.</i>	320	26,240.00	6,581.25
<i>General Motors Corp.</i>	3,522	158,490.00	42,719.93
<i>Goodyear Tire and Rubber Co.</i>	3,243	119,991.00	16,387.08
<i>International Nickel Co. of Canada, Ltd.</i>	400	22,400.00	12,035.25
<i>Kennecott Copper Corp.</i>	506	39,974.00	37,737.50
<i>Marine Midland Corp.</i>	2,152	53,800.00	29,033.33
<i>Monsanto Chemical Co.</i>	714	27,846.00	20,185.79
<i>National Dairy Products Corp.</i>	575	33,925.00	27,779.69
<i>National Fuel Gas Co.</i>	1,850	43,475.00	39,854.49
<i>National Lead Co.</i>	250	20,750.00	22,021.94
<i>New York Air Brake Co.</i>	400	10,400.00	8,646.84
<i>Ohio Oil Co.</i>	600	20,400.00	20,218.97
<i>Owens-Illinois Glass Co.</i>	100	9,700.00	9,112.50
<i>Panhandle Eastern Pipe Line</i>	400	18,000.00	14,684.95
<i>Peoples Drug Stores, Inc.</i>	400	13,600.00	14,585.20
<i>Pfizer, Chas., and Co., Inc.</i>	1,071	34,272.00	15,219.02
<i>Phelps Dodge Corp.</i>	600	30,600.00	19,207.25
<i>Potomac Electric Power Co.</i>	2,500	77,500.00	66,420.58

ASSETS OF ENDOWMENT FUNDS (Continued)

August 31, 1960

CONSOLIDATED ENDOWMENT FUNDS (Continued)

	SHARES	VALUE	
		MARKET	BOOK
STOCKS—COMMON (Continued)			
Public Service Electric and Gas Co.....	500	20,000.00	15,992.09
Reliable Stores Corp.....	550	9,350.00	8,721.43
R. J. Reynolds Tobacco Co.....	200	16,000.00	5,112.50
Riggs National Bank (Washington, D. C.).....	713	106,237.00	62,463.37
Rochester Gas and Electric Corp.....	412	19,364.00	19,800.00
Security Storage Co. of Washington.....	335	10,720.00	5,038.50
Socony Mobil Oil Co., Inc.....	2,604	98,952.00	48,095.17
Southern California Edison Co.....	853	55,445.00	26,061.55
Standard Oil Co. of California.....	1,697	74,668.00	22,576.46
Standard Oil Co. of New Jersey.....	225	9,225.00	11,432.81
Suburban Trust Co.....	360	26,280.00	20,880.00
Sunray Mid-Continent Oil.....	1,155	26,565.00	25,300.00
Transamerica Corporation.....	1,000	27,000.00	24,686.90
Travelers Insurance Co.....	1,000	88,000.00	16,045.68
Union Carbide Corp.....	45	5,220.00	3,802.50
United Gas Corporation.....	915	31,110.00	16,922.35
Virginia Electric and Power Co.....	410	19,680.00	14,512.50
Woodward and Lothrop, Inc.....	300	18,600.00	20,208.75
Woolworth, F. W., Co.....	420	28,560.00	20,541.27
Wm. Wrigley Jr., Co.....	310	25,420.00	24,673.33
		<u>2,505,503.00</u>	<u>1,504,338.79</u>

TOTAL STOCKS AND BONDS..... 6,768,852.00 5,390,538.79

REAL ESTATE—Strong Hall, 620 21st Street, NW..... 184,246.00

TRUST NOTES RECEIVABLE

Crowe, F. C.—Secured by 160 acres of land in Pemiscot County, Missouri. Due December 15, 1960.....	%	
Gardiner, A. S.—Secured by 1631 L Street, NW. Due \$80 including interest the 18th of each month.....	4	5,954.46
Newman, E.—Secured by 807 Villa Ridge Road, Falls Church, Virginia. Due \$75 including interest the 15th of each month.....	4½	6,143.93
Stephens, E. E.—Secured by 4321 20th St., NE. Due \$90 including interest the 28th of each month.....	4½	5,853.68
	5	10,249.01
		<u>28,201.08</u>

CASH..... 5,897.35

TOTALS { Consolidated Endowment Funds.....	5,981,056.00
Reserve for Protection of Consolidated Endowment Funds Investments.....	<u>113,678.91</u>
	<u>6,094,734.91</u>

ASSETS OF ENDOWMENT FUNDS (Continued)

August 31, 1960

SCOTTISH RITE FUND

	DESCRIPTION	%	DUE	VALUE	
				PAR	MARKET
BONDS					BOOK
American Telephone and Telegraph Co.	Debenture.....	2¾	1980	25,000	20,250.00
International Bank for Rec. and Dev.	Twenty-One Years.....	4¼	1978	16,000	15,840.00
Lexington and Eastern Railway Co.	First Mortgage.....	5	1965	12,000	12,000.00
National Cash Register Co.	Sinking Fund Debenture.....	4¾	1985	42,000	43,680.00
Northern Pacific Railway Co.	Prior Lien Railway and Land Grant	4	1997	25,000	21,750.00
State Loan and Finance Corp.	Sinking Fund Debenture.....	3¾	1966	20,000	18,800.00
"	Sinking Fund Debenture Reg.....	5.40	1980	10,000	10,100.00
"	Sinking Fund Sub. Deb. Reg.....	5¾	1978	5,000	4,850.00
Tennessee Gas Transmission Co.	Debenture.....	4¼	1974	15,000	13,800.00
United States of America.	Treasury.....	2¼	1959-62	72,000	70,920.00
"	Treasury B Registered.....	2¾	1975-80	25,000	23,075.00
"	Treasury.....	3¼	1978-83	50,000	46,000.00
"	Treasury.....	3¼	1985	6,000	5,520.00
"	Treasury.....	3½	1990	25,000	23,400.00
"	Treasury.....	4	1969	25,000	25,450.00
"	Certificates of Indebtedness.....	4¾	1961	50,000	50,450.00
"	Treasury Notes.....	4	1963	25,000	25,450.00
"	Treasury Notes.....	4½	1965	40,000	41,800.00
"	General Mortgage.....	5	1960	14,000	14,000.00
Washington Gas Light Co.	Guaranteed First Mortgage Reg.	4	2361	14,000	8,260.00
West Shore Railroad Co.					495,395.00
					516,000.00

STOCKS—PREFERRED				
		RATE OR %	SHARES	
Baltimore Gas and Electric Co.....	Cumulative C.....	4	130	11,180.00
Celanese Corporation of America.....	Cumulative A.....	4½	200	15,400.00
General Motors Corporation.....	Cumulative.....	\$3.75	40	3,360.00
Genesco, Inc.....	Cumulative.....	\$3.50	50	3,700.00
Gulf Power Co.....	Cumulative.....	4.64	100	9,100.00
Illinois Power Co.....	Cumulative, Par Value \$50.....	4.26	400	17,600.00
International Harvester Co.....	Cumulative.....	7	50	7,350.00
May Department Stores.....	Cumulative.....	3¾	150	11,550.00
Montgomery Ward and Co.....	Cumulative A.....	\$7	100	15,400.00
Pacific Telephone and Telegraph Co....	Cumulative.....	6	200	27,600.00
Philadelphia Electric Co.....	Cumulative.....	3.8	100	8,300.00
Philip Morris and Co., Ltd., Inc.....	Cumulative.....	4	138	11,454.00
R. J. Reynolds Tobacco Co.....	Cumulative.....	3.60	200	16,800.00
				<u>158,794.00</u>
				<u>188,431.31</u>

ASSETS OF ENDOWMENT FUNDS (Continued)

August 31, 1960

SCOTTISH RITE FUND (Continued)

	SHARES	VALUE	
		MARKET	BOOK
STOCKS—COMMON			
American Telephone and Telegraph Co.....	918	87,210.00	45,791.36
Cincinnati Milling Machine Co.....	1,000	30,000.00	18,609.10
Commonwealth Edison Co.....	1,034	68,244.00	23,472.60
Continental Oil Co.....	2,000	106,000.00	15,145.46
Ford Motor Co.....	150	9,750.00	9,675.00
General Electric Co.....	1,200	98,400.00	17,210.00
Goodyear Tire and Rubber Co.....	2,806	103,822.00	10,370.45
International Nickel Co. of Canada, Ltd.....	600	33,600.00	13,032.50
May Department Stores.....	463	23,613.00	14,588.25
Montgomery Ward and Co.....	1,500	48,000.00	32,577.25
New York State Electric and Gas Corp.....	1,232	34,496.00	23,988.65
Panhandle Eastern Pipe Line.....	300	13,500.00	10,963.94
Pfizer, Chas., and Co., Inc.....	357	11,424.00	5,073.00
Riggs National Bank (Washington, D. C.).....	695	103,555.00	32,599.26
Standard Oil Co. of California.....	486	21,384.00	2,591.38
Standard Oil Co. of New Jersey.....	3,216	131,856.00	37,435.66
Union Carbide Corporation.....	900	104,400.00	25,122.50
United Gas Corporation.....	770	26,180.00	13,851.66
		<u>1,055,434.00</u>	<u>352,098.02</u>
TOTAL STOCKS AND BONDS.....		<u>1,709,623.00</u>	<u>1,056,529.33</u>
CASH.....			<u>41.03</u>
TOTALS { Scottish Rite Fund.....		1,000,000.00	
{ Reserve for Protection of Scottish Rite Investments.....		56,570.36	<u>1,056,570.36</u>

SUMMARY OF ASSETS OF ENDOWMENT FUNDS

August 31, 1960

INVESTMENTS

	TOTAL	CONSOLIDATED	SCOTTISH RITE
Bonds.....	4,402,200.00	3,886,200.00	516,000.00
Preferred Stocks.....	674,283.00	485,851.69	188,431.31
Common Stocks.....	1,856,436.81	1,504,338.79	352,098.02
	<u>6,932,919.81</u>		
Real Estate.....	184,246.00	184,246.00	
Trust Notes.....	28,201.08	28,201.08	
	<u>7,145,366.89</u>	<u>6,088,837.56</u>	<u>1,056,529.33</u>
CASH.....	5,938.38	5,897.35	41.03
			<u>41.03</u>
TOTALS—EXHIBIT A.....	<u>7,151,305.27</u>	<u>6,094,734.91</u>	<u>1,056,570.36</u>

ENDOWMENT FUNDS—HELD IN TRUST BY OTHERS

August 31, 1960

FUNDS	TRUSTEES	BOOK VALUE
Andrews Scholarship Fund.....	American Security and Trust Co.....	5,195.00
Coope Unrestricted Fund.....	Riggs National Bank.....	24,371.00
Fry Professorship Fund.....	National Savings and Trust Co.....	105,850.00
Harvey Scholarship Fund.....	Riggs National Bank.....	4,651.00
Sanders Fellowship Fund.....	National Savings and Trust Co.....	223,177.00
Sharpe School of Medicine Fund.....	National Savings and Trust Co.....	8,217.00
Spencer Scholarship Fund.....	Northern Trust Co.....	7,422.00
TOTAL—EXHIBIT A.....		<u>378,883.00</u>

ASSETS OF PLANT FUNDS

August 31, 1960

LAW CENTER FUND

BONDS	DESCRIPTION	%	DUE	PAR	VALUE MARKET	BOOK
	Beneficial Industrial Loan Corp.....	2½	1961	35,000	34,650.00	35,000.00
	Federal Land Banks.....	4¾	1961	25,000	25,300.00	25,031.25
	Safeway Stores, Inc.....	3.70	1961	50,000	49,850.00	49,826.30
	United States of America.....	4¾	1961	15,000	15,120.00	15,000.00
	Notes.....	3½	1961	30,000	30,120.00	30,000.00
					<u>155,040.00</u>	<u>154,857.55</u>

STOCKS—COMMON

	SHARES	
Houston Oil Co. of Texas—Liquidating.....	40	1.00

CASH

TOTAL.....	5,838.81
	<u>160,697.36</u>

ASSETS OF PLANT FUNDS
August 31, 1960
FORD FOUNDATION HOSPITAL BUILDING FUND

	DESCRIPTION	%	DUE	VALUE	
				PAR	MARKET
BONDS					BOOK
Safeway Stores, Inc.	Debenture.....	3.70	1961	113,000	112,661.00
United States of America.	Notes.....	4	1961	113,000	113,904.00
"	Certificates of Indebtedness.....	4½	1961	20,000	20,180.00
					<u>246,745.00</u>
					<u>245,606.72</u>
CASH.....					<u>10,148.16</u>
TOTAL.....					<u>255,754.88</u>

CONSOLIDATED PLANT FUNDS

BONDS					
Safeway Stores, Inc.	Debenture.....	3.70	1961	45,000	44,865.00
United States of America.	Certificates of Indebtedness.....	3½	1961	10,000	10,010.00
"	Certificates of Indebtedness.....	4½	1961	25,000	25,200.00
					<u>80,075.00</u>
CASH.....					<u>25,228.06</u>
TOTAL.....					<u>105,340.28</u>

SUMMARY OF ASSETS OF PLANT FUNDS

August 31, 1960

INVESTMENTS	August 31, 1960		
	<u>TOTAL</u>	<u>LAW CENTER</u>	<u>FORD</u>
			<u>CONSOLIDATED</u>
Bonds.....	480,576.49	154,857.55	245,606.72
Common Stocks.....	1.00	1.00	80,112.22
Cash.....	41,215.03	5,838.81	10,148.16
TOTALS—EXHIBIT A.....	521,792.52	160,697.36	255,754.88
			<u>25,228.06</u>
			<u>105,340.28</u>

LAND AND BUILDINGS

For the Year Ended August 31, 1960

Building or Location	Lot	Square	Year Acquired or Erected	Balance August 31, 1959	Net Additions	Balance August 31, 1960
Adams Hall.....	824	120	1957	657,678.44	.....	657,678.44
Alumni Office.....	23	56	1954	15,000.00	.....	15,000.00
Bacon Hall.....	39	102	1956	296,093.93	.....	296,093.93
Biological Sciences Building C.....	Part of 834	102	1914-35	151,129.97	20,424.01	171,553.98
Book Store.....	Part of 843	79	1949	48,105.49	.....	48,105.49
Cancer Clinic.....	1-2-801-802	39	1948-52	544,956.34	20,347.12	565,303.46
Cemetery Lot.....	343	52-56	1884	1.00	.....	1.00
Chapin Hall.....	Part of 838	79	1948	85,301.23	.....	85,301.23
Chemistry Storage Vault.....	Part of 834	102	1958	63,975.81	3,227.04	67,202.85
Classroom—Research Building, G Street..	50	.....	.....	40,000.00	.....	40,000.00
Corcoran Hall.....	Part of 834	102	1919-24	350,498.96	41,662.85	392,161.81
Faculty Parking Lot.....	847	56	1936	236,431.05	.....	236,431.05
Field House Site 11-17-19-20-25-26-27-28-29-35-36-37-38-39-42-43-49-800-801-806-807-808-809-816-817-821-822-824-825-826-827-830-831-832-833-834	Part of 834	57	1947	404,163.97	66,129.00	470,292.97
Gymnasium.....	845-846	102	1924-25	58,331.44	.....	58,331.44
Hall of Government.....	Entire Square	79	1918-38	329,745.14	.....	329,745.14
Hospital.....	827-828-830-831-833-834	54	1945	7,682,529.93	3,860.14	7,686,390.07
Hospital Parking Lot 34-35-801 thru 808-810 thru 815-824	827-828-830-831-833-834	40	1949	252,653.86	.....	252,653.86
Law Center Building.....	828-838-843	79	1955	4,534.34	.....	4,534.34
Lisner Auditorium.....	Part of 834	102	1929-41	883,474.35	986.64	884,460.99
Lisner Library.....	840	56	1912-39	385,526.94	.....	385,526.94
Madison Hall.....	844	79	1957	600,813.10	.....	600,813.10
Montroe Hall.....	.....	79	1938-51	711,917.99	.....	711,917.99

Nurses Home.....	844	55	1947	401,500.00	.....	401,500.00
Pharmacology Laboratory.....	27-28-816-817	79	1944	100,091.18	.....	100,091.18
Physics Laboratory.....	Part of 843	79	1947	26,075.12	.....	26,075.12
President's Office.....	Part of 834	102	1936	11,700.00	.....	11,700.00
Samson Hall.....	Part of 834	102	1923-30	103,331.02	.....	103,331.02
School of Medicine.....	43	250	1882-1932	1,005,160.10	.....	1,006,698.98
Shop, Stockroom.....	53	101	1943	26,761.24	.....	26,761.24
Social Sciences Building D.....	Part of 834	102	1922-36	543,305.70	.....	543,305.70
Sorority Hall—2112 G Street, NW.....	816	80	1948	30,000.00	.....	30,000.00
" 2129 G Street, NW.....	805	79	1936	36,989.72	.....	36,989.72
" 2131 G Street, NW.....	Part of 8	79	1935	25,500.00	.....	25,500.00
" 802 21st Street, NW.....	35	77	1938	13,000.00	.....	13,000.00
Staughton Hall.....	834-835	79	1941	62,574.67	.....	62,574.67
Stockton Hall.....	Part of 834	102	1920-25	283,056.44	.....	283,056.44
Student Activities Building.....	41	79	1947	75,000.00	.....	75,000.00
Student Parking Lot—2314 I St., NW.....	831	41	1945-53	618,787.43	.....	618,787.43
Student Union Building.....	804-836	79	1947-48	528,057.96	.....	528,057.96
Tompkins Engineering Building.....	847	56	1953	843,527.55	.....	843,527.55
Welling Hall.....	15	55	1947	209,047.72	.....	209,047.72
Women's Physical Education Building.....	812-815-843	55	1960	.....	190,000.00	190,000.00

LAND AND BUILDINGS (Continued)

For the Year Ended August 31, 1960

Building or Location	Lot	Square	Year Acquired or Erected	Balance August 31, 1959	Net Additions	Balance August 31, 1960
G Street, NW—1910.....	C	121	1949	20,000.00	.....	20,000.00
" 2002.....	27	103	1949	33,600.00	.....	33,600.00
" 2024.....	16	103	1922	14,955.00	.....	14,955.00
" 2026.....	15	103	1929	15,074.96	.....	15,074.96
" 2030.....	13	103	1957	21,000.00	.....	21,000.00
" 2033.....	Part of 834	102	1922	32,500.00	.....	32,500.00
" 2106.....	817	80	1937	19,000.00	.....	19,000.00
" 2108.....	41	80	1946	31,500.00	.....	31,500.00
" 2110.....	40	80	1949	69,479.23	.....	69,479.23
" 2114.....	815	80	1949	47,250.00	.....	47,250.00
" 2116.....	A	80	1946	20,500.00	.....	20,500.00
" 2118.....	B	80	1946	17,500.00	.....	17,500.00
" 2135.....	807	79	1943	14,000.00	.....	14,000.00
" 2313-15-17-19-21.....	803-829	42	1947	23,400.00	.....	23,400.00
H Street, NW—1909.....	800	119	1948	32,500.00	.....	32,500.00
" 1911-13.....	3	119	1948	67,711.70	.....	67,711.70
" 1916.....	47	120	1960	.....	20,000.00	20,000.00
" 1921.....	802	119	1952	32,500.00	.....	32,500.00
" 1923.....	803	119	1949	38,000.00	.....	38,000.00
" 2001.....	55-86-800 thru 805	101	1956	180,307.20	1,100.00	181,407.20
" 2011.....	806	101	1943	13,000.00	.....	13,000.00

2017	810	101	1954	25,000.00	25,000.00
"	2020	102	1922	98,516.71	98,516.71
"	2023	101	1954	12,000.00	12,000.00
"	2025	101	1945	21,000.00	21,000.00
"	2027	101	1941	11,000.00	11,000.00
"	2029	101	1945	11,500.00	11,500.00
"	2031	101	1948	13,000.00	13,000.00
"	2037	101	1940	23,500.00	23,500.00
"	2107-09	77	1956	42,246.31	42,246.31
"	2113	77	1940	42,431.25	42,431.25
"	2125	77	1954	21,000.00	21,000.00
"	2127-29-31-33	77	1946	7,500.00	36,500.00
"	2136	79	1951	85,000.00	85,000.00
"	2137	77	1948	30,500.00	30,500.00
"	2141-43-45-47	77	1960	83,000.00	83,000.00
"	2142	79	1935	1,500.00	1,500.00
"	2142½	79	1940	3,000.00	3,000.00
"	2207	55	1959	13,000.00	13,000.00
"	2209	55	1945	6,650.00	6,650.00
"	2211	55	1948	16,125.00	16,125.00
"	2213	55	1946	13,000.00	13,000.00
"	2314 (rear)	42	1960	1,000.00	1,000.00
"	2217	55	1944	32,500.00	32,500.00
"	2300	42	1942	10,750.00	10,750.00
"	2308	42	1948	7,900.00	7,900.00
"	2312	42	1948	7,000.00	7,000.00
"	2316	42	1947	9,600.00	9,600.00
"	2318	42	1955	7,000.00	7,000.00
"	2324	42	1956	4,000.00	4,000.00

LAND AND BUILDINGS (Continued)

For the Year Ended August 31, 1960

Building or Location	Lot	Square	Year Acquired or Erected	Balance August 31, 1959	Net Additions	Balance August 31, 1960
I Street, NW—2012.	829-830-831	101	1945	68,000.00	.....	68,000.00
" " 2018.	21	101	1946	50,000.00	.....	50,000.00
" " 2038.	840	101	1942	10,000.00	.....	10,000.00
" " 2104-06.	27-28	77	1947	11,800.00	20,000.00	31,800.00
" " 2114.	55-56-833-834	77	1947	39,650.00	.....	39,650.00
" " 2119.	807	75	1957	6,500.00	.....	6,500.00
" " 2130-32-34.	827-828-829	77	1958	36,000.00	24,003.46	60,003.46
" " 2136.	826	77	1948	15,000.00	.....	15,000.00
" " 2138.	825	77	1945	5,000.00	.....	5,000.00
" " 2200.	24	55	1959	28,500.00	.....	28,500.00
" " 2204.	22	55	1949	12,000.00	.....	12,000.00
19th Street, NW—804.	22	119	1958	27,500.00	.....	27,500.00
" " 808.	20	119	1949	30,000.00	.....	30,000.00
20th Street, NW—700.	Part of 834	102	1931	17,500.00	.....	17,500.00
" " 706.	23	102	1950	36,870.03	.....	36,870.03
" " 712.	Part of 834	102	1929	14,240.00	.....	14,240.00
" " 714.	Part of 834	102	1930	14,500.00	.....	14,500.00
" " 716.	Part of 834	102	1929	13,500.00	3,332.50	16,832.50
" " 718.	Part of 834	102	1929	20,000.00	.....	20,000.00
" " 811-813.	805	119	1959	45,000.00	.....	45,000.00

606-08.....	21-22	80	1955	12,500.00	13,000.00
713-15-17.....	Part of 834	102	1929	53,500.00	12,500.00
714.....	Part of 841	79	1931	40,000.00	53,500.00
716.....	Part of 841	79	1933	8,885.00	40,194.38
718.....	Part of 841	79	1939	16,422.00	8,885.00
806.....	33	77	1959	17,500.00	16,422.00
810.....	31	77	1938	9,000.00	17,500.00
812.....	841	77	1954	21,000.00	9,000.00
814.....	840	77	1944	13,000.00	21,000.00
815-17.....	820-821	101	1960	45,000.00	13,000.00
22nd Street, NW-719.....	847	79	1952	51,833.00	45,000.00
"	33	79	1960	7,600.00	76,333.00
"	34	79	1945	18,500.00	14,869.03
"	802-803	55	1946	16,500.00	7,600.00
"	801	55	1956	9,000.00	18,500.00
"	800	55	1945	14,000.00	16,500.00
"	814-815-816	77	1960	56,000.00	9,000.00
"	C	55	1946	18,750.00	56,000.00
"	839	55	1948	35,800.00	14,000.00
"	817-818-819	77	1948	25,000.00	18,750.00
"	831	55	1952	7,000.00	35,800.00
"	830	55	1945	9,250.00	25,000.00
"	829	55	1947	9,500.00	7,000.00
"	50	77	1956	11,000.00	9,250.00
"	815	75	1946	12,000.00	9,500.00
"	816-817	75	1950	16,003.84	11,000.00
"	843	75	1960	3,000.00	28,003.84
"	850	75	1948	12,550.00	3,000.00
"	822	75	1958	12,800.00	12,550.00

EQUIPMENT

For the Year Ended August 31, 1960

	BALANCE AUGUST 31, 1959	ADDITIONS	BALANCE AUGUST 31, 1960
Adams Hall.....	42,425.21	.....	42,425.21
Administration.....	441,357.65	49,957.22	491,314.87
Bookstores.....	13,043.60	130.00	13,173.60
Cancer Clinic.....	73,660.07	4,511.03	78,171.10
Faculty Dining Room.....	2,284.48	.....	2,284.48
Gymnasium.....	2,927.37	.....	2,927.37
Hospital.....	1,743,732.84	155,968.59	1,899,701.43
Human Resources Laboratory.....	48,324.48	.....	48,324.48
Instruction—General.....	236,057.31	58,267.02	294,324.33
" Law School.....	13,590.56	.....	13,590.56
" School of Engineering.....	301,838.84	13,169.63	315,008.47
" School of Medicine.....	230,803.04	22,802.57	253,605.61
" School of Pharmacy.....	26,371.70	485.44	26,857.14
Interns Residence.....	4,302.62	.....	4,302.62
Library Books—General.....	399,915.77	33,958.08	433,873.85
" Law School.....	191,171.91	18,135.93	209,307.84
" School of Medicine.....	77,794.30	10,930.53	88,724.83

Lisner Auditorium.....	94,844.28	.....	94,844.28
Lisner Library.....	67,741.92	798.14	68,540.06
Madison Hall.....	58,234.59	.....	58,234.59
Motor Vehicles.....	4,352.01	.....	4,352.01
Nurses Home.....	9,710.60	.....	9,710.60
Strong Hall.....	18,200.00	.....	18,200.00
Student Union.....	46,363.45	.....	46,363.45
Welling Hall.....	59,949.64	.....	59,949.64
	<u>4,208,998.24</u>	<u>369,114.18</u>	<u>4,578,112.42</u>

Less Depreciation—Cancer Clinic Equipment.....	15,000.00	4,500.00	19,500.00
“ Hospital Equipment.....	1,304,000.00	62,300.00	1,366,300.00
	<u>1,319,000.00</u>	<u>66,800.00</u>	<u>1,385,800.00</u>

TOTAL—EXHIBIT A.....	<u>2,889,998.24</u>	<u>302,314.18</u>	<u>3,192,312.42</u>
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DESIGNATED CURRENT FUNDS—SPONSORED RESEARCH
For the Year Ended August 31, 1960

FUNDS	Balance August 31, 1959	Receipts	Disbursements			Balance August 31, 1960
			Salaries	Other Expense	Total	
Arts and Sciences.....	53,238.88	3,161,003.74	2,201,067.63	935,241.29	3,136,308.92	77,933.70
Cancer Clinic Building.....	142,603.59	153,447.97	102,251.20	45,943.92	148,195.12	147,856.44
Graduate Council.....	13,364.92	.....	7,023.36	853.82	7,877.18	5,487.74
Law School.....	599.08	65,344.05	7,570.74	471.26	8,042.00	57,901.13
School of Engineering.....	13,862.15	142,582.68	67,879.10	30,808.46	98,687.56	57,757.27
School of Medicine.....	492,519.48	953,905.09	431,188.76	458,042.22	889,230.98	557,193.59
School of Pharmacy.....	215.70	.....	.....	107.40	107.40	108.30
Overhead.....	.....	(-13,040.00)	.....	(-13,040.00)	(-13,040.00)	.....
TOTALS—EXHIBIT D.....	716,403.80	4,463,243.53	2,816,980.79	1,458,428.37	4,275,409.16	904,238.17

For the Year Ended August 31, 1960

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FUNDS	Balance August 31, 1959	Net Income	Deductions		Balance August 31, 1960
			Current Operations	Added to Principal	
ENDOWMENT FUNDS—UNRESTRICTED (SCHEDULE 12)					
Acker.....		17.00	17.00		
Alumni.....		42.00	42.00		
American Airlines.....		44.00	44.00		
Bragg.....		14.00	14.00		
Campaign.....		10,605.02	10,605.02		
Coope.....		926.14	926.14		
Corcoran.....		12,511.00	12,511.00		
Davis.....		2,376.00	2,376.00		
Dulac.....		43.00	43.00		
Durst.....		114.00	114.00		
Goddard.....		1,910.00	1,910.00		
Haggett.....		57.00	57.00		
King.....		1,092.00	1,092.00		
Poole.....		57.00	57.00		
Reichelderfer.....		852.00	852.00		
River Raisin.....		57.00	57.00		
Sanders.....		120.00	120.00		
Sothern.....		284.00	284.00		
Subscription Gifts.....		712.00	712.00		
Syms.....		85.00	85.00		
Teller.....		7,784.00	7,784.00		
Trustees.....		89.00	89.00		

INVESTMENT INCOME (Continued)

For the Year Ended August 31, 1960

For the Year Ended August 31, 1960					
FUNDS	Balance August 31, 1959	Net Income	Deductions		Balance August 31, 1960
			Current Operations	Added to Principal	
ENDOWMENT FUNDS—DESIGNATED (Continued) (Schedule 12)					
School of Medicine—Bartsch-Dunne.....	.....	280.00	280.00	.....	939.00
" Borden.....	.....	211.00	211.00	.....	2,420.00
" Collins.....	778.00	161.00	.....	.....	.....
" Cooper*.....	1,906.95	567.82	54.77	.....	.....
" Cummings.....	.....	568.00	568.00	.....	.....
" Eppley.....	.....	57.00	57.00	.....	.....
" Ford Foundation.....	.....	85,978.00	85,978.00	.....	.....
" Gardner.....	.....	255.00	255.00	.....	.....
" Lewis.....	.....	2,351.00	2,351.00	.....	.....
" Meyer.....	.....	12,959.00	12,959.00	.....	.....
" Ruffin.....	.....	3,267.00	3,267.00	.....	.....
" School of Medicine.....	.....	921.00	921.00	.....	.....
" Sharpe.....	.....	429.27	429.27	.....	.....
" Tompkins.....	59.00	202.00	.....	.....	261.00
School of Pharmacy—Gibbs.....	.....	568.00	568.00	.....	.....
Plant—Graduate.....	.....	880.00	880.00	.....	.....
" National University Library.....	.....	1,045.00	1,045.00	.....	.....
" Schouler National University Library.....	.....	86.00	86.00	.....	.....
			284,677.61		
			284,622.84		
			54.77		
SCHEDULE 1.....					
*SCHEDULE 10.....					

SCHEDULE 1

*SCHEDULE 10

INVESTMENT INCOME (Continued)

For the Year Ended August 31, 1960

FUNDS	Balance August 31, 1959	Net Income	Deductions		Balance August 31, 1960
			Current Operations	Added to Principal	
ENDOWMENT FUNDS—DESIGNATED (Continued) (Schedule 12)					
Scholarship—Andrews.....	498.11	286.82	300.00	.....	484.93
" Bartsch.....	680.00	1,139.00	680.00	459.00	680.00
" Transferred to Bartsch-Dunne Fund.....	226.00	157.00	200.00	.....	183.00
" Bradley.....	.....	20.00	.....	.....	20.00
" Briggs.....	.....	5,426.69	.....	869.00	5,418.00
" Britten.....	.....	2,762.00	3,300.00	.....	2,439.00
" Carr.....	2,977.00	284.00	500.00	.....	1,078.00
" Carter, H. H.....	1,294.00	57.00	100.00	.....	5.00
" Carter, M. M.....	48.00	.....	.....	.....	.....
Columbian Women Funds					
" Brown.....	65.00	68.00	65.00	.....	68.00
" Chamberlin.....	124.00	131.00	124.00	.....	131.00
" College Women's.....	27.00	29.00	27.00	.....	29.00
" Founders of Columbian Women.....	270.00	284.00	270.00	.....	284.00
" Hardy Foundation.....	83.00	88.00	83.00	.....	88.00
" Herron.....	270.00	284.00	270.00	.....	284.00
" Knapp.....	270.00	284.00	270.00	.....	284.00
" McWilliam.....	54.00	57.00	54.00	.....	57.00
" Wilson.....	54.00	57.00	.....	.....	111.00

Davis.....	43.00	57.00	80.00	20.00
D. C.—D. A. R.	615.00	483.00	450.00	648.00
Dorsey.....	2,236.00	802.00	.....	3,038.00
Drane.....	216.00	219.00	.....	435.00
Erwin.....	428.00	284.00	300.00	412.00
Farnham.....	206.00	57.00	100.00	163.00
Fisher.....	228.00	56.00	75.00	209.00
Green.....	58.00	135.55	.....	193.00
Hampel.....	47.00	29.00	40.00	36.00
Harvey.....	298.45	251.83	200.00	350.28
Hazelton.....	343.00	284.00	350.00	277.00
Kendall.....	323.00	339.00	323.00	339.00
Morehouse.....	62.00	85.00	125.00	22.00
Pearson.....	501.00	161.00	200.00	462.00
Phi Delta Delta Fraternity.....	52.00	43.00	40.00	55.00
Powell.....	34,775.00	2,842.00	736.00	36,881.00
Shepard.....	604.00	568.00	750.00	422.00
Spencer.....	252.26	145.20	175.00	222.46
Stone.....	399.00	114.00	200.00	313.00
Swisher.....	700.00	852.00	700.00	750.00
Walker.....	152.00	142.00	294.00	.....
Withington.....	110.00	112.00	150.00	72.00
Woodhull.....	84.00	34.00	40.00	78.00
Scholarships Awarded.....	.....	.....	11,571.00	.....

INVESTMENT INCOME (Continued)

For the Year Ended August 31, 1960

FUNDS		Balance August 31, 1959	Net Income	Deductions		Balance August 31, 1960
				Current Operations	Added to Principal	
ENDOWMENT FUNDS—DESIGNATED (Continued) (Schedule 12)						
Prize—Burns.....	74.00	57.00	55.00	.....	76.00
" Cowles.....	244.00	170.00	165.00	.....	249.00
" Croissant.....	93.00	57.00	50.00	.....	100.00
" Davis.....	78.00	57.00	55.00	.....	80.00
" Cutter.....	128.00	40.00	60.00	.....	108.00
" Essary.....	344.00	170.00	200.00	.....	314.00
" Evans.....	56.00	94.00	100.00	.....	50.00
" Fitch.....	166.00	57.00	75.00	.....	148.00
" Glover.....	91.50	85.50	50.00	.....	127.00
" Goddard.....	478.00	314.00	300.00	.....	492.00
" Horwitz.....	24.00	103.00	100.00	.....	27.00
" Hubbard.....	132.00	57.00	.....	.....	189.00
" Kappa Beta Pi Legal Sorority.....	22.00	15.00	16.00	.....	21.00
" Larner.....	243.00	45.50	31.50	.....	257.00
" Mahler.....	21.00	6.00	2.00	.....	25.00
" Ordronaux.....	433.00	284.00	290.00	.....	427.00
" Ruggles.....	85.00	29.00	35.00	.....	79.00
" Staughton-Elton.....	115.00	29.00	.....	.....	144.00
" Sterrett.....	30.00	16.75	15.75	.....	31.00
" Swisher.....	453.00	57.00	.....	.....	510.00
" Walsh.....	423.00	57.00	.....	.....	480.00
" Weddell.....	507.00	284.00	350.00	.....	441.00
Prizes Awarded.....			1,950.25			

Library Books—Gladstone.....	72.00	10.00	2,910.00	82.00
Green.....	821.00	862.00	170.00	1,513.00
Hensley-Troutman.....	86.00	25.00	.....	111.00
Howard.....	4,403.00	568.10	122.10	4,849.00
Meyer.....	578.00	57.00	.....	635.00
Noyes.....	4,469.00	568.06	631.06	4,406.00
Prewitt.....	105.00	105.00	.....	105.00
Swisher.....	1,552.00	120.74	3.74	1,669.00
EXHIBIT G.....	.....	.....	3,836.90	.....
LOAN FUNDS (Schedule 11) National Defense.....	.....	200.13	.....	200.13
DESIGNATED CURRENT FUNDS (Schedule 10B)	.....	.....	.....	.....
Commonwealth.....	.....	7,556.25	.....	7,556.25
Freed Foundation.....	.....	40.00	.....	40.00
PLANT FUNDS (Schedule 13)	.....	.....	.....	.....
Field House.....	.....	67.00	.....	67.00
Ford Foundation Hospital Building.....	.....	8,120.24	.....	8,120.24
Hospital Building.....	.....	360.00	.....	360.00
Law Center.....	.....	4,270.16	.....	4,270.16
Pairo (income used for athletics).....	.....	908.94	908.94	.....
Physical Medicine Hospital Equipment.....	.....	302.00	.....	302.00
School of Medicine Building.....	.....	402.00	.....	402.00
Wolfe Hospital Equipment.....	.....	837.00	.....	837.00
Women's Activities Building.....	.....	180.31	.....	180.31
SCHEDULE 1.....	.....	.....	908.94	.....
TOTALS—DESIGNATED INCOME—EXHIBIT D.....	102,735.27	347,376.22	312,699.70	112,700.67
TOTALS—INVESTMENT INCOME.....	102,735.27	392,169.38	357,492.86	112,700.67

DESIGNATED CURRENT FUNDS—MISCELLANEOUS
For the Year Ended August 31, 1960

FUNDS	Balance August 31, 1959	Additions		Deductions	Balance August 31, 1960
		Gifts	Other		
SCHOLARSHIP, FELLOWSHIP					
Allen.....	200.00	.....	.....	Scholarships.....	200.00
Alpha Zeta Omega Pharmaceutical Fraternity.....	519.50	500.00	.....	"	500.00
American Foreign Service.....	.....	1,500.00	.....	"	1,500.00
American Foundation Pharmaceutical Education.....	.....	400.00	.....	"	250.00
American Legion Auxiliary.....	.....	250.00	.....	"	.....
American Society of Women Accountants.....	100.00	.....	.....	"	100.00
Association of Federal Communications Consulting Engineers.....	.....	856.70	.....	"	856.70
Babione.....	120.00	.....	.....	"	120.00
Banta Co. Foundation.....	750.00	.....	.....	"	750.00
Brooklyn Alumni Club.....	.....	1,050.00	.....	"	1,050.00
Capital Farm and Garden Association.....	.....	400.00	.....	"	400.00
Columbian Women.....	.....	337.00	.....	"	337.00
Crown Photo Service.....	500.00	500.00	.....	"	500.00
D. C. Pharmaceutical Association.....	541.33	600.00	.....	"	891.33
Delta Delta Delta Sorority.....	250.00	100.00	.....	"	100.00
Drips.....	21.69	250.00	.....	"	250.00
Dunbar P. T. A.....	7.69	103.31	.....	"	16.25
Firestone Tire and Rubber Co.....	.....	(-7.69)	.....	"	.....
Fort Knox Thrift Shop.....	.....	800.00	.....	"	800.00
General Motors Corporation.....	100.00	6,224.00	.....	"	200.00
Georgetown Business and Professional Women.....	115.02	200.00	.....	"	100.00
Giant Food Stores.....	.....	589.42	.....	"	704.44
Grand Street Boys' Foundation.....	.....	1,000.00	.....	"	1,000.00
Gutwerk.....	.....	300.00	.....	"	300.00

Jude.	1,000.00	1,000.00	1,000.00
Jewish Men's Club of White Plains.	100.00	100.00	100.00
Kappa Alpha Theta Sorority.	500.00	500.00	500.00
Kappa Phi Fraternity.	150.00	150.00	150.00
Ki-Wives of Washington.	554.39	554.39	554.39
Lancaster P. T. A.	50.00	50.00	50.00
Lederle Laboratories.	1,200.00	1,200.00	1,200.00
Lewis.	5,000.00	5,000.00	5,000.00
Loudoun County School Board.	350.00	350.00	350.00
Lutheran Church of Reformation.	500.00	448.51	51.49
Massachusetts Board of Education.	198.00	198.00	198.00
Meyer Foundation.	3,500.00	3,500.00	3,500.00
Milbank.	152.50	152.50	152.50
National Association of Secondary School Principals.	532.90	532.90	532.90
National Science Foundation Cooperative Graduate.	6,870.00	6,870.00	6,870.00
Order of Eastern Star—Pennsylvania.	400.00	400.00	400.00
Ormsby.	24.61	(-24.61)	100.00
Panhellenic Association.	300.00	300.00	300.00
Phi Delta Gamma Sorority.	200.00	200.00	200.00
President's.	1,900.00	1,000.00	1,000.00
Prince Hall Grand Lodge.	1,000.00	1,000.00	1,000.00
Roberts Memorial Foundation.	468.00	468.00	468.00
School of Medicine "A"	1,000.00	1,200.00	1,200.00
Scottish Rite—Alabama.	3,600.00	3,600.00	3,600.00
Arizona.	2,243.50	2,243.50	2,243.50
California.	7,068.00	7,068.00	7,068.00
Colorado.	1,800.00	1,800.00	1,800.00
Florida.	1,800.00	1,800.00	1,800.00
Japan.	1,800.00	1,800.00	1,800.00
Kansas.	1,800.00	1,800.00	1,800.00
Kentucky.	1,800.00	1,800.00	1,800.00
Louisiana.	4,480.00	4,480.00	4,480.00
Maryland.	1,800.00	1,800.00	1,800.00
Minnesota.	1,800.00	1,800.00	1,800.00
Mississippi.	5,400.00	5,400.00	5,400.00
Missouri.	6,114.00	6,114.00	6,114.00
Montana.	3,600.00	3,600.00	3,600.00

DESIGNATED CURRENT FUNDS—MISCELLANEOUS

For the Year Ended August 31, 1960

FUNDS	Balance August 31, 1959	Additions		Deductions	Balance August 31, 1960
		Gifts	Other		
SCHOLARSHIP, FELLOWSHIP (Continued)					
Scottish Rite—New Mexico.....				Scholarships.....	3,600.00
Oregon.....	3,600.00	3,600.00		".....	3,600.00
".....				".....	2,098.00
South Dakota.....		2,542.00		".....	1,800.00
Taiwan.....		1,800.00			
Tennessee.....		1,800.00			
Texas.....	225.00	(—225.00)			
Virginia.....		1,800.00		".....	1,800.00
Washington.....		3,600.00		".....	1,800.00
".....		3,600.00		".....	1,242.00
West Virginia.....		300.00		".....	300.00
Sears Roebuck Foundation.....		300.00		".....	300.00
Stead Ranches.....	50.00	50.00		".....	50.00
Tau Kappa Epsilon Fraternity.....				".....	967.06
Texas Co.....	1,500.00	(—532.94)		".....	500.00
Tobacco Industry Research Committee.....		1,000.00		".....	500.00
Tressler Lutheran Home for Children.....	.10	400.00		".....	359.54
Washington Area School Study Council.....		2,000.00		".....	2,000.00
Washington Ballet Guild.....		198.00		".....	198.00
Winn-Dixie Stores Foundation.....		125.00		".....	125.00
Wolcott Foundation.....		5,124.00		".....	5,124.00
Women's Advertising Club.....	300.00			".....	300.00
Women's Club of Chevy Chase.....		212.50			212.50
Women's Club of Lyon Village.....		400.00		".....	400.00
Woodrow Wilson Foundation.....	1,500.00	1,500.00		".....	1,500.00
Zeta Tau Alpha Foundation.....		200.00		".....	200.00
Zonta Club.....		350.00		".....	350.00

[illegible]

DESIGNATED CURRENT FUNDS—MISCELLANEOUS

For the Year Ended August 31, 1960

FUNDS	Balance August 31, 1959	Additions		Deductions	Balance August 31, 1960
		Gifts	Other		
HOSPITAL					
Arthritis and Rheumatism Foundation.....		2,045.00	.....	To Schedule 1....	2,045.00
Damon Runyon Memorial.....		3,000.00	.....	To Schedule 1....	587.00
D. C. Cancer Aid Group.....		3,500.00	.....	To Schedule 1....	2,916.00
Hoffman-La Roche, Inc.....		3,000.00	.....	To Schedule 1....	1,915.00
Hospital House Staff.....		.....	2,424.44	To Schedule 1....	5,374.92
Multiple Sclerosis Association—Physical Medicine.....	3,981.48	6,150.00	.....	To Schedule 1....	1,031.00
.....	.....	1,000.00	.....	To Schedule 1....	6,150.00
.....	.....	.....	.....	To Schedule 1....	184.11
National Foundation—Polio Center.....	38,405.27	57,300.00	.....	To Schedule 1....	46,097.49
LAW SCHOOL					
Food Law Institute.....		1,000.00	.....	To Schedule 1....	1,000.00
Library—Bruce Buttes.....		10.00	.....	To Schedule 1....	10.00
Patent, Trademark and Copyright Foundation.....	8,393.63	66,302.79	.....	To Schedule 1....	74,696.42
GSA—OOS—39001.....		16,498.70	.....	To Schedule 1....	8,546.01
Washington Foreign Law Society Publications.....		364.14	.....	To Schedule 1....	158.14
LIBRARY—MUSIC ROOM.....	384.40	.....	.....	.....	384.40
SCHOOL OF ENGINEERING—TEXAS Co.—Electrical.....	.....	100.00	.....	To Schedule 1....	100.00
SCHOOL OF GOVERNMENT—BROOKINGS INSTITUTION.....	.....	5,000.00	.....	.....	5,000.00

SCHEDULE 10B—PAGE 3

DESIGNATED CURRENT FUNDS—AGENCY

For the Year Ended August 31, 1960

Funds	Balance August 31, 1959	Deposits	Withdrawals	Balance August 31, 1960
Alumni Reception Room.....	454.00	130.00	.....	584.00
Flowers.....	51.85	.....	15.00	36.85
Ford Foundation Municipal Manpower Commission.....	224,032.28	.....	221,533.72	2,498.56
Pridgen, Stella J.....	400.00	.....	400.00	.....
Women's Hospital Board—Courier.....	928.11	5,688.63	5,742.47	874.27
“ Gift Shop.....	(-1,260.46)	44,672.51	38,936.88	4,475.17
TOTALS—EXHIBIT D.....	224,605.78	50,491.14	266,628.07	8,468.85

CHANGES IN PRINCIPAL OF LOAN FUNDS

For the Year Ended August 31, 1960

FUNDS	Balance August 31, 1959	Additions				U. S. Government	Balance August 31, 1960
		Gifts	Interest on Loans	Investment Income	University Surplus		
Himes.....	17,306.53	77.21	158.45	.....	.....	.....	17,542.19
Home Economics.....	382.35	.....	.....	.....	.....	.....	382.35
Kellogg Hospital Administration.....	.....	10,000.00	.....	.....	.....	.....	10,000.00
Kellogg School of Medicine.....	20,852.43	.....	94.25	.....	.....	.....	20,946.68
Law Association.....	2,527.64	55.00	37.63	.....	.....	.....	2,620.27
National Defense.....	44,666.00	.....	.....	200.13	10,607.00	95,452.00	150,925.13
Pfizer.....	1,046.61	.....	8.42	.....	.....	.....	1,055.03
Schoenfeld.....	2,076.59	60.00	18.88	.....	.....	.....	2,155.47
School of Medicine.....	15,623.91	904.79	107.60	.....	.....	.....	16,636.30
Sutherland.....	1,634.82	2.10	1.04	.....	.....	.....	1,637.96
University.....	9,419.43	.....	287.13	.....	(-9,706.56)	.....	.....
TOTALS—EXHIBIT E.....	115,536.31	11,099.10	713.40	200.13	900.44	95,452.00	223,901.38

SCHEDULE 11

CHANGES IN PRINCIPAL OF ENDOWMENT FUNDS

For the Year Ended August 31, 1960

Funds	Balance August 31, 1959	Additions			Deductions	Balance August 31, 1960
		Gifts	Investment Income	Other		
UNRESTRICTED						
Acker.....	300.00	.....	.....	.....	.....	300.00
Alumni.....	732.00	.....	.....	.....	.....	732.00
American Airlines.....	1,000.00	.....	.....	.....	.....	1,000.00
Bragg.....	250.00	.....	.....	.....	.....	250.00
Campaign.....	186,750.00	.....	.....	.....	.....	186,750.00
Coope.....	24,371.00	.....	.....	.....	.....	24,371.00
Corcoran.....	220,160.00	.....	.....	.....	.....	220,160.00
Davis.....	41,890.00	.....	.....	.....	.....	41,890.00
Dulac.....	1,000.00	.....	.....	.....	.....	1,000.00
Durst.....	2,000.00	.....	.....	.....	.....	2,000.00
Goddard.....	33,610.00	.....	.....	.....	.....	33,610.00
Haggett.....	1,000.00	.....	.....	.....	.....	1,000.00
King.....	19,220.00	.....	.....	.....	.....	19,220.00
Poole.....	1,000.00	.....	.....	.....	.....	1,000.00
Reichelderfer.....	15,000.00	.....	.....	.....	.....	15,000.00
River Rain.....	1,000.00	.....	.....	.....	.....	1,000.00
Sanders.....	2,110.00	.....	.....	.....	.....	2,110.00
Sothern.....	5,000.00	.....	.....	.....	.....	5,000.00
Subscription Gifts.....	12,530.00	.....	.....	.....	.....	12,530.00
Syms.....	1,500.00	.....	.....	.....	.....	1,500.00
Teller.....	136,980.00	.....	.....	.....	.....	136,980.00
Trustees.....	1,570.00	.....	.....	.....	.....	1,570.00
Walsh.....	100.00	.....	.....	.....	.....	100.00
Weddell.....	10,000.00	.....	.....	.....	.....	10,000.00
Willard Association.....	1,000.00	.....	.....	.....	.....	1,000.00
Withers.....	26,900.00	.....	.....	.....	.....	26,900.00
Woodhull.....	50,000.00	.....	.....	.....	.....	50,000.00

CHANGES IN PRINCIPAL OF ENDOWMENT FUNDS (Continued)

For the Year Ended August 31, 1959

FUNDS	Balance August 31, 1959	Additions			Deductions	Balance August 31, 1960
		Gifts	Investment Income	Other		
RESTRICTED (Continued)						
COLUMBIAN COLLEGE—Burton.....	15,660.00					15,660.00
LAW SCHOOL—Altizer.....	1,000.00					1,000.00
" Cummins.....	97,476.00					97,476.00
" DeKnight.....	130,690.00					130,690.00
SCHOOL OF ENGINEERING—Howard.....	3,620.00					3,620.00
" School of Engineering.....	800.00					800.00
SCHOOL OF GOVERNMENT—Rankin.....	279,710.00					279,710.00
" Scottish Rite.....	1,000,000.00					1,000,000.00
SCHOOL OF MEDICINE						
Bartsch-Dunne.....	5,346.00					5,805.00
Income of Bartsch Scholarship Fund.....			459.00			3,710.00
Borden.....	3,710.00					2,830.00
Collins.....	2,830.00					10,000.00
Cooper.....	10,000.00					10,000.00
Cummins.....	10,000.00					1,000.00
Eppley.....	1,000.00					2,000,000.00
Ford Foundation.....	2,000,000.00					4,490.00
Gardner.....	4,490.00					44,380.00
Lewis.....	44,380.00					306,370.00
Meyer.....	306,370.00					57,490.00
Ruffin.....	57,490.00					16,953.00
School of Medicine.....	16,953.00					8,216.79
Sharpe.....	8,216.79	1,640.00				
Increase in assets.....				.21		8,217.00
Tompkins.....	4,740.00					4,740.00

SCHOOL OF PHARMACY—Gibbs.....	10,000.00				10,000.00
HOSPITAL					
Cancer Clinic.....	599.00				599.00
Chapman.....	1,230.00				1,230.00
Clephane.....	1,025.00				1,025.00
General.....	1,980.00				1,980.00
Hirsh.....	37,640.00				37,640.00
Horwitz.....		3,475.00			3,475.00
Houser.....	2,500.00				2,500.00
Kauffman.....	1,000.00				1,000.00
Kimmel.....	3,080.00				3,080.00
Kulbank.....	1,920.00				1,920.00
Maloney.....	5,000.00	105.00			5,000.00
National Park Seminary.....	500.00				500.00
Patient Aid.....	106,170.00				106,170.00
Reinhardt.....	500.00				500.00
Strong.....	15,000.00				15,000.00
Tree.....	10,000.00				10,000.00
Woodbury.....	10,000.00				10,000.00
HOSPITAL EQUIPMENT					
Marvin, Dorothy Betts.....	60,640.58	10.00	.42		60,651.00

CHANGES IN PRINCIPAL OF ENDOWMENT FUNDS (Continued)

For the Year Ended August 31, 1960

Funds	Balance August 31, 1959	Additions			Deductions	Balance August 31, 1960
		Gifts	Investment Income	Other		
RESTRICTED (Continued)						
SCHOLARSHIP						
Andrews.....	5,194.95			.05		5,195.00
Increase in assets.....						20,040.00
Bartsch.....	20,040.00					2,760.00
Bradley.....	2,760.00					257,260.00
Britten.....		257,251.31	8.69			48,610.00
Carr.....	48,610.00					5,000.00
Carter, H. H.....	5,000.00					1,000.00
Carter, M. M.....	1,000.00					
Columbian Women Funds						
Briggs.....	500.00					500.00
Brown.....	1,200.00					1,200.00
Chamberlin.....	2,300.00					2,300.00
College Women's.....	500.00					500.00
Founders of Columbian Women.....	5,000.00					5,000.00
Hardy Foundation.....	2,000.00					2,000.00
Herron.....	5,000.00					5,000.00
Knapp.....	5,000.00					5,000.00
McWilliams.....	1,000.00					1,000.00
Wilson.....	1,000.00					1,000.00

Davis.....	1,000.00				1,000.00
D. C.—D. A. R.....	8,230.00	1,500.00			9,730.00
Dorsey.....	14,470.00	14.00			14,484.00
Drane.....	5,000.00				5,000.00
Erwin.....	5,000.00				5,000.00
Farnham.....	1,000.00				1,000.00
Fisher.....	1,000.00				1,000.00
Green.....	3,317.00	156.45	.55		3,474.00
Hampel.....	500.00				500.00
Harvey.....	4,650.63				
Increase in assets.....				.37	4,651.00
Hazelton.....	5,000.00				5,000.00
Kendall.....	5,960.00				5,960.00
Morehouse.....	1,500.00				1,500.00
Pearson.....	2,840.00				2,840.00
Phi Delta Delta Fraternity.....	1,000.00				1,000.00
Powell.....	50,000.00				50,000.00
Shepard.....	10,000.00				10,000.00
Spencer.....	7,422.20				
Decrease in assets.....				.20	7,422.00
Stone.....	2,000.00				2,000.00
Swisher.....	15,395.00	102.00			15,497.00
Walker.....	2,500.00				2,500.00
Withington.....	1,960.00				1,960.00
Woodhull.....	600.00				600.00

CHANGES IN PRINCIPAL OF ENDOWMENT FUNDS (Continued)

For the Year Ended August 31, 1960

FUNDS	Balance August 31, 1959	Additions			Deductions	Balance August 31, 1960
		Gifts	Investment Income	Other		
RESTRICTED (Continued)						
Prize	1,000.00					1,000.00
Burns	3,000.00					3,000.00
Cowles	1,000.00					1,000.00
Croissant	1,000.00					1,000.00
Cutter	700.00					700.00
Davis	3,000.00					3,000.00
Essary	1,700.00	100.00				1,800.00
Evans	1,000.00					1,000.00
Fitch	2,000.00					2,000.00
Glover	5,520.00					5,520.00
Goddard	2,500.00					2,500.00
Horwitz	1,000.00					1,000.00
Hubbard	350.00					350.00
Kappa Beta Pi Legal Sorority	800.00					800.00
Larner	100.00					100.00
Mahler	5,000.00					5,000.00
Ordronaux	500.00					500.00
Ruggles	500.00					500.00
Staughton-Elton	300.00					300.00
Sterrett	1,000.00					1,000.00
Swisher	1,000.00					1,000.00
Walsh	5,000.00					5,000.00
Weddell						

PLANT									
Graduate.....	15,496.00	240.00							15,736.00
National University Library.....	18,390.00								18,390.00
Schouler National University Library.....	1,520.00								1,520.00
	7,083,175.78	274,386.76	2,376.03		.63	.20			7,359,939.00
RESERVES FOR PROTECTION OF INVESTMENTS									
Consolidated Endowment Funds.....	99,670.11								
Net gain on sale of investments.....					14,008.80				113,678.91
Scottish Rite Fund.....	57,650.36								
Loss on sale of investments.....						1,080.00			56,570.36
	7,240,496.25	274,386.76	2,376.03		14,009.43	1,080.20			7,530,188.27
TOTALS—EXHIBIT F.....									

CHANGES IN PRINCIPAL OF PLANT FUNDS
For the Year Ended August 31, 1960

FUNDS	Balance August 31, 1959	Additions		Deductions Plant	Balance August 31, 1960
		Gifts	Investment Income Other		
Cancer Clinic Building— WARDS.....		6,000.00		6,000.00	
Cancer Clinic Equipment					437.31
Beta Gamma Phi Sorority.....	437.31			275.50	
Special.....	2,026.00	275.50		2,026.00	
Marion M. Bond and Mary A. Wood Memorial.....	406.79				406.79
Zito.....					3,116.69
Field House.....	2,417.69	632.00	67.00		
Hospital Building					255,754.88
Ford Foundation.....	247,634.64		8,120.24		
General.....		28,107.10	360.00		29,477.74
Transferred from Surplus.....			1,010.64		
Hospital Equipment					392.15
Cardiovascular.....	370.36	1,404.50		1,382.71	
General.....	44.00	170.00		170.00	44.00
Multiple Sclerosis.....	1,202.80	5,100.00		786.60	5,516.20
Obstetrics and Gynecology O. P. Clinic.....	10,891.24		302.00	1,552.29	9,640.95
Physical Medicine.....	102.91			102.91	
Prenatal Nursery.....	30,251.05		837.00		31,088.05
Wolfe Ophthalmology.....	200.00			200.00	
Women's Board Gift Shop.....					

LAW CENTER.....	154,695.20	1,732.00	4,270.16	.....	.....	160,697.36
Library Books.....	.....	.....	.....	.....	.....	.....
Brooklyn Alumni Club.....	430.50	.....	.....	.....	430.50	.....
Council of Religious Organizations.....	245.44	.....	.....	.....	.....	245.44
George, Carlotta.....	.....	17.00	.....	.....	17.00	.....
Hellenic Society.....	225.00	.....	.....	.....	.....	225.00
Merrill Lynch, Pierce, Fenner and Beane.....	1,127.87	.....	.....	.....	72.67	1,055.20
Noyes.....	263.11	.....	.....	.....	263.11	.....
Rosen.....	127.47	.....	.....	.....	127.47	.....
Ruediger.....	.....	350.00	.....	.....	.....	350.00
Pairo.....	40,623.73	.....	.....	.....	.....	.....
Gain on sale of investments.....	.....	.....	.....	3,581.72	44,205.45	.....
School of Medicine Building.....	13,525.00	2,715.00	402.00	.....	.....	16,642.00
Women's Activities Building.....	6,522.45	.....	180.31	.....	.....	6,702.76
TOTALS—EXHIBIT G.....	513,770.56	46,503.10	14,538.71	4,592.36	57,612.21	521,792.52

GIFTS AND GRANTS
For the Year Ended August 31, 1960

CURRENT FUNDS

UNRESTRICTED—SCHEDULE 1	
Eastman Kodak Co.....	2,000.00
Equitable Life Assurance Society.....	1,000.00
First National City Bank of New York.....	340.00
General Alumni Fund.....	27,272.33
General Motors Corporation.....	3,388.00
Gulf Oil Co.....	221.00
Household Finance Co.....	350.00
Independent College Funds of America.....	195.02
International Business Machines.....	748.00
Johns-Manville Fund.....	1,000.00
Massachusetts Mutual Life Insurance Co.....	123.63
McGraw-Hill Publishing Co.....	66.00
Merrill Lynch, Pierce, Fenner, Smith.....	500.00
National Merit Scholarship Corporation.....	250.00
Price Waterhouse Foundation.....	1,000.00
Radio Corporation of America.....	300.00
Texas Co.....	1,932.94
United States Steel Foundation.....	2,000.00
Woodruff, Dr. A. M.....	35.00
	<hr/> 42,721.92
DESIGNATED—HOSPITAL—SCHEDULE 1	
Cancer Clinic.....	10,411.60
Hospital.....	4,685.90
	<hr/> 15,097.50
DESIGNATED—SPONSORED RESEARCH—SCHEDULE 10	
	4,275,409.16

<i>Scholarship, Fellowship—various donors.</i>	111,797.58
<i>Prize—various donors.</i>	455.00
Columbia College—Religion—Milbank Foundation.	12,500.00
“ National Science Foundation—NSF—7693—Botany—adjust 1958-59.	(-3,321.32)
“ Fellowship—Woodrow Wilson National Fellowship Foundation.	500.00
“ Hospital—Arthritis and Rheumatism Foundation.	2,045.00
“ Damon Runyon Memorial Fund.	3,000.00
“ D. C. Cancer Aid Group.	3,500.00
“ Hoffman-La Roche, Inc.	3,000.00
“ Physical Medicine—Multiple Sclerosis Association.	6,150.00
“ Patient Hospitalization	1,000.00
“ Polio Center—National Foundation.	57,300.00
“ Law School—Food Law Institute.	1,000.00
“ Library—Bruce Buttle.	10.00
“ Patent, Trademark and Copyright Foundation.	82,801.49
“ Washington Foreign Law Society Publications.	364.14
“ School of Engineering—Electrical—Texas Co.	100.00
“ School of Government—Brookings Institution.	5,000.00
“ School of Medicine—American Medical Education Foundation.	5,160.00
“ Dermatology—Dr. H. Ford Anderson.	583.50
“ Medicine, Education, Research—various donors.	2,555.00
“ National Fund for Medical Education.	38,340.00
“ Obstetrics, Gynecology—Education, Research.	18,842.06
“ “ Hospitalization.	10,051.00
“ Post-Graduate Medical Education.	355.60
“ Psychiatry, Education, Research.	140.00
“ Surgery, Education, Research.	6,975.00
“ Wyeth Laboratories—adjust 1958-59.	(-1,530.00)
“ “ “	75.00
“ School of Pharmacy—Special Gifts—various donors.	600.00
“ Miscellaneous—Band Uniforms—General Alumni Association.	1,000.00
“ Faculty Salaries—Newell W. Ellison.	1,667.00
“ “ Sidney W. and Sylvia N. Sowers.	500.00
“ “ Harold A. Wheeler.	250.00
“ Speech Clinic Foundation—National Speech Clinic Foundation.	51,694.83
“ General Alumni Association—various donors.	424,460.88
“ “ transferred to specified funds.	51,694.83
	372,766.05
	4,663,272.71

GIFTS AND GRANTS (Continued) For the Year Ended August 31, 1960

LOAN FUNDS (Schedule 11)

Himes Fund—Dr. Robert H. Reed.....	77.21
Kellogg Hospital Administration Fund—W. K. Kellogg Foundation.....	10,000.00
Law Association Fund—General Alumni Association.....	55.00
Schoenfeld Fund—Schoenfeld family.....	60.00
" William Gross.....	537.26
School of Medicine Fund—Dr. Ruth Benedict.....	165.00
" General Alumni Association.....	85.58
" The Speculum.....	116.95
" various donors.....	904.79
Sutherland Fund—various donors.....	2.10
	<hr/> 11,099.10

ENDOWMENT FUNDS (Schedule 12)

Professorship—Tompkins Fund—Chas. H. Tompkins Co.....	5,000.00
Library—Prewitt Fund—Lillian Prewitt Goodknight.....	5,000.00
School of Medicine—School of Medicine Fund—various donors.....	1,640.00
" 3,000.00	
Hospital—Horwitz Fund—Dr. Alec Horwitz.....	300.00
" George Stirling.....	100.00
" Dr. Samuel F. Higgin.....	50.00
" Mrs. Myrtle Shanker.....	25.00
" Mrs. Samuel Dessoff.....	
Hospital Equipment—Dorothy Betts Marvin Fund—Hospital Women's Board.....	3,475.00
Scholarship—Britten Fund—Bequest of Alma Hand Britten.....	10.00
" D. C.—D. A. R. Fund—D. C.—D. A. R.....	257,251.31
" Dorsey Fund—Harryman Dorsey.....	1,500.00
" Green Fund—Alpha Theta Chapter of Pi Lambda Theta Sorority.....	14.00
Prize—Evans Fund—General Alumni Association.....	156.45
Plant—Graduate Fund—various donors.....	100.00
	<hr/> 274,386.76

PLANT FUNDS (Schedule 15)

Cancer Clinic Building—WARDS		
Cancer Clinic Equipment—General—Women's Auxiliary Dental Society		6,000.00
Field House—General Alumni Association		275.50
Hospital Building—General—Washington Post Co.	25,000.00	632.00
" Cora and Saul Kaufmann Memorial	500.00	
" Mrs. Robert Livingston	300.00	
" Dr. Richard E. Kelso	100.00	
" Ruth M. Leverton	100.00	
" Mrs. Donald M. Wilson	100.00	
" various donors	2,007.10	28,107.10
Hospital Equipment—Cardiovascular—Washington Heart Association	604.50	
" Hoffman—LaRoche, Inc.	500.00	
" Margaret Bonebrake	100.00	
" various donors	200.00	
" General—George Washington University Wife's Group	5,000.00	1,404.50
" Obstetrics and Gynecology Out-Patient Department—Stern Family	100.00	170.00
" various donors	840.00	5,100.00
Law Center—General Alumni Association	932.00	
" various donors	1,365.00	1,732.00
Library Books—Carlotta George—Kathleen E. Clifford	250.00	17.00
" Ruediger—Pi Lambda Theta Fraternity	250.00	350.00
School of Medicine Building—General Alumni Association	200.00	
" Bruce B. Derrick	150.00	
" Bernhard Kaufman	100.00	
" Joanne Derrick Suppler	100.00	
" William H. Cooper	50.00	
" 1959-60 Medical Students		
" Robert T. Lyons		
" John D. Joliet		
" Pauline Soverstein		
TOTAL	2,715.00	46,503.10
		5,037,983.59

DESCRIPTION OF LOAN FUNDS

August 31, 1960

HIMES LOAN FUND—Created in 1957 by Joseph H. Himes to be loaned to students of the School of Medicine.....	17,542.19
HOME ECONOMICS LOAN FUND—Created in 1940 by the D. C. Home Economics Association to be loaned to senior girls majoring in home economics.....	382.35
KELLOGG HOSPITAL ADMINISTRATION LOAN FUND—Created in 1960 by the W. K. Kellogg Foundation to be loaned to graduate students in hospital administration.....	10,000.00
KELLOGG SCHOOL OF MEDICINE—Created in 1942 by the W. K. Kellogg Foundation to be loaned to students of the School of Medicine.....	20,946.68
LAW ASSOCIATION LOAN FUND—Created in 1941 by the George Washington Law Association to be loaned to students of the Law School.....	2,620.27
NATIONAL DEFENSE LOAN FUND—Created in 1959 by the United States Government and The George Washington University, to be loaned to full-time students.....	150,925.13
PFIZER LOAN FUND—Created in 1953 by Chas. Pfizer and Co., Inc., to be loaned to students of the School of Medicine....	1,055.03
SCHOENFELD LOAN FUND—Created in 1953 by various donors as a memorial to Benjamin Schoenfeld, to be loaned to students in the School of Pharmacy.....	2,155.47
SCHOOL OF MEDICINE LOAN FUND—Created in 1952 by School of Medicine students to be loaned to students of the School of Medicine.....	16,636.30
SUTHERLAND LOAN FUND—Created in 1941 by Rose L. Sutherland and other donors, to be loaned to students of the School of Medicine.....	1,637.96

DESCRIPTION OF ENDOWMENT FUNDS

August 31, 1960

UNRESTRICTED FUNDS

ACKER FUND—Bequest of George N. Acker, M.D., received in 1924, the income to be used as required.....	300.00
ALUMNI ENDOWMENT FUND—Created by the Class of 1920, to be added to by succeeding graduates, the income to be used as required.....	732.00
AMERICAN AIRLINES FUND—Created in 1957 by American Airlines, Inc., the income to be used as required.....	1,000.00
BRAGG FUND—Created in 1955 by James Elton Bragg, the income to be used as required.....	250.00
CAMPAIGN FUND—Created in 1923 by various donors, the income to be used as required.....	186,750.00
COOPE FUND—Bequest of Jessie Coope, A.B. in Education 1930, received in 1956, in memory of her brother, Lieutenant Colonel Harry Coope, the income to be used as required.....	24,371.00
CORCORAN FUND—Gifts of William W. Corcoran and other donors between the years 1871-86, the income to be used as required.....	220,160.00
DAVIS FUND—Bequest of Harry C. Davis, received in 1946, the income to be used as required.....	41,890.00
DULAC FUND—Bequest of Victor Dulac, received in 1955, the income to be used as required.....	1,000.00
DURST FUND—Created in 1953 by Dr. Sidney C. Durst in memory of his wife, Clara Saunders Durst, the income to be used as required.....	2,000.00
GODDARD ENDOWMENT FUND—Bequest of Frederick J. Goddard, received in 1949, the income to be used as required...	33,610.00
HAGGETT FUND—Created in 1941 by Isabelle Barnes Haggett, the income to be used as required.....	1,000.00
KING, W. B., FUND—Created in 1941 by William B. King, the income to be used as required.....	19,220.00
POOLE FUND—Bequest of George Poole in 1951, the income to be used as required.....	1,000.00

DESCRIPTION OF ENDOWMENT FUNDS (Continued)

August 31, 1960

UNRESTRICTED FUNDS (Continued)

REICHELDERFER FUND—Created by Mary M. Reichelderfer in 1945 in memory of her husband, Luther H. Reichelderfer, the income to be used as required.....	15,000.00
RIVER RAISIN FOUNDATION FUND—Created in 1955 by the River Raisin Foundation, the income to be used as required.....	1,000.00
SANDERS ENDOWMENT FUND—Created by J. Sanders in 1945, the income to be used as required.....	2,110.00
SOTHERN FUND—Bequest of Julia Marlowe Sothern, received in 1951, the income to be used as required.....	5,000.00
SUBSCRIPTION GIFTS FUND—Created by various donors during the years 1845-51, the income to be used as required.....	12,530.00
SYMS FUND—Bequest of Samuel Syms in 1891, the income to be used as required.....	1,500.00
TELLER FUND—Created in 1949 by bequest of John D. Teller and added to by Mary L. Teller, the income to be used as required.....	136,980.00
TRUSTEES FUND—Created by the Board of Trustees of the University in 1932, the income to be used as required.....	1,570.00
WALSH FUND—Created in 1954 by John E. Walsh, the income to be used as required.....	100.00
WEDDELL FUND—Created in 1948 by bequests of Alexander W. Weddell and Virginia Chase Weddell, the income to be used as required.....	10,000.00
WILLARD ASSOCIATION FUND—Gift of the Willard Association in 1950, the income to be used as required.....	1,000.00
WITHERS FUND—Gifts of John Withers and other donors during the years 1851-70, the income to be used as required..	26,900.00
WOODHULL FUND—Bequest of Margaret Willett Woodhull, received in 1946, the income to be used as required.....	50,000.00

FELLOWSHIP FUNDS

KING FELLOWSHIP FUND—Created in 1928 by bequest of Isabella Osborn King, the income to be used for a fellowship in biology.....	75,330.00
MULLER FELLOWSHIP FUND—Bequest of Robin Miller, received in 1954, the income to be used for fellowships in medicine for study of cardiovascular disease.....	55,310.00
SANDERS FELLOWSHIP FUND—Bequest of Addie Sanders in 1928 in memory of her brother, Thomas Bradford Sanders, the income to be used for fellowships in various academic fields of study.....	223,177.00

PROFESSORSHIP FUNDS

ALUMNI PROFESSORSHIP FUND—Gifts of various alumni since 1911, the income to be used for an alumni professorship in mathematics.	830.00
CARROLL PROFESSORSHIP FUND—Created by Mary A. Sharpe in 1928 in memory of Mitchell Carroll, the income to be used for a chair in archeology.	500.00
CONGRESSIONAL PROFESSORSHIP FUND—Created in 1832 by gift of the United States of America by Act of Congress, the income to be used for professorships.	158,710.00
DEPEW COURSE IN PUBLIC SPEAKING FUND—Created by May Depew in 1936, the income to be used for a course to be known as the "Chauncey M. Depew Course in Public Speaking".	170,600.00
ELTON PROFESSORSHIP FUND—Bequest of Romeo Elton of Exeter, England, in 1872, the income to be used for a professorship to be called the "Elton Professorship of Mental and Moral Philosophy".	14,510.00
FORD FOUNDATION PROFESSORSHIP FUND—Created in 1956 by the Ford Foundation, the income to be used to increase faculty salaries. After ten years, the principal sum may be used for either salary support or any other academic purpose.	776,000.00
FRY PROFESSORSHIP FUNDS—Bequest of Annabel Lee Fry, received in 1945, in memory of her husband, Dr. Henry D. Fry, the income to be used for a professorship in physiology.	105,850.00
Created in 1945 from income of the original fund, the income of the two funds to be used for a professorship in physiology.	46,886.00
TOMPKINS PROFESSORSHIP FUND—Created in 1958 by gift of Chas. H. Tompkins Co., the income to be added to principal until principal is large enough to support a professorship to be known as the Chas. H. Tompkins Professorship in Civil Engineering.	13,303.00
YULEE PROFESSORSHIP FUND—Bequest of Nannie Yulee Noble in 1929 in memory of her mother, Nancy Yulee, the income to be used for lectures in home economics.	5,000.00

DESCRIPTION OF ENDOWMENT FUNDS (Continued)

August 31, 1960

SCHOOL FUNDS

COLUMBIAN COLLEGE
BURTON FUND—Created in 1957 by gift of Grace C. Burton, the income to be used for Columbian College..... 15,660.00

ENGINEERING

HOWARD LECTURE FUND—Created in 1952 by Frank A. Howard, the income to be used for lectures on engineering... 3,620.00
SCHOOL OF ENGINEERING FUND—Created in 1954, the income to be used for the School of Engineering..... 800.00

GOVERNMENT

RANKIN FUND—Bequest of John O. Rankin, received in 1951, the income to be used for the School of Government... 279,710.00
SCOTTISH RITE FUND—Created in 1928 by the Supreme Council of the Ancient and Accepted Scottish Rite of Freemasonry of the Southern Jurisdiction of the United States of America, as a permanent memorial to George Washington, The Mason, the income to be used to maintain a School of Government..... 1,000,000.00

LAW

ALTIZER FUND—Gift of Bertha E. M. Altizer in 1954, in memory of P. J. Altizer, the income to be used for the Law School..... 1,000.00
CUMMINGS FUND—Bequest of Homer S. Cummings in 1957, in memory of Julia M. Cummings, the income to be used for the Law School..... 97,476.00
DeKNIGHT FUND—Bequest of Clarence W. DeKnight, the income to be used for the Law School..... 130,690.00

MEDICAL

BARTSCH-DUNNE RESEARCH FUND—Created in 1952 by Dr. Anna Bartsch-Dunne from income of the Bartsch Scholarship Fund, the income to be used for research in medicine..... 5,805.00
BORDEN MEDICAL FUND—Created in 1936 by Dr. Daniel L. Borden and Jennie Ella Borden, in memory of William C. Borden, the income to be used for the School of Medicine..... 3,710.00
COLLINS MEMORIAL RESEARCH FUND—Created in 1946 by various donors in memory of Dr. James Lloyd Collins, the income to be used for special research in surgery..... 2,830.00

COOPER MEDICAL RESEARCH FUND—Bequest of Eleanor J. Cooper in 1905, on certain terms since modified by the Supreme Court of D. C. as follows: the income to be used toward the establishment and maintenance, in connection with the Medical Department of the University, of a Research Laboratory, the work of this laboratory to be devoted to the investigation of the nature, causation, prevention, and cure of malaria and other infectious and contagious diseases.....

10,000.00

CUMMINGS FUND—Bequest of Julia M. Cummings in 1955 in memory of Cecilia Cummings, the income to be used for research and education in cardiovascular and similar diseases.....

10,000.00

EPPLEY MEDICAL SCHOOL FUND—Bequest of Mary V. Eppley in 1951, the income to be used for cancer research in the School of Medicine.....

1,000.00

FORD FOUNDATION MEDICAL SCHOOL FUND—Created in 1956 by the Ford Foundation, the income to be used for instruction in the School of Medicine. After ten years, both principal and income may be used for medical education.....

2,000,000.00

GARDNER MEDICAL SCHOOL FUND—Bequest of William D. Gardner in 1928, the income to be used for the School of Medicine.....

4,490.00

LEWIS MEDICAL SCHOOL FUND—Bequest of Samuel E. Lewis in 1925, the income to be used for the School of Medicine

44,380.00

MEYER MEDICAL SCHOOL FUND—Created in 1955 by gifts of various donors, the income to be used for the Eugene Meyer Chair of Medicine.....

306,370.00

RUFFIN MEDICAL SCHOOL FUND—Bequest of Dr. Sterling Ruffin in 1951, the income to be used for the School of Medicine.....

57,490.00

SCHOOL OF MEDICINE FUND—Created in 1940 by various donors, the income to be used for the School of Medicine..

18,593.00

SHARPE MEDICAL SCHOOL FUND—Created by Mary A., Elizabeth M., and Sallie Sharpe in 1924, the income to be used for the School of Medicine.....

8,217.00

TOMPKINS, CHAS. H., MEDICAL SCHOOL MEMORIAL FUND—Created in 1958 by gifts of various donors, the income to be used for annual lectures in surgery.....

4,740.00

PHARMACY

GIBBS PHARMACY FUND—Created by M. G. Gibbs in 1927, the income to be used to aid in establishing and maintaining a commercial pharmacy course in connection with the School of Pharmacy.....

10,000.00

DESCRIPTION OF ENDOWMENT FUNDS (Continued)

August 31, 1960

HOSPITAL FUNDS

CANCER CLINIC FUND—Created in 1953 by Mr. and Mrs. V. A. Klein, the income to be used for the Cancer Clinic...	599.00
CHAPMAN HOSPITAL FUND—Bequest of Mrs. Susanna A. Chapman in 1911, the income to be used for the purposes of the free wards of the hospital.....	1,230.00
CLEPHANE HOSPITAL FUND—Created in 1951 by Washington Alumnae of Zeta Tau Alpha Sorority, in memory of Beatrice A. Clephane, the income to be used for the hospital.....	1,025.00
GENERAL HOSPITAL FUND—Created in 1929 by various donors, the income to be used for the hospital.....	1,980.00
HIRSH HOSPITAL FUND—Bequest of Bella Hirsh in 1955, the income to be used for the hospital.....	37,640.00
HORWITZ HOSPITAL FUND—Created in 1960 by Dr. Alec Horwitz, the income to be used to care for indigent clinical patients of the surgical resident staff of the hospital.....	3,475.00
HOUSER HOSPITAL FUND—Bequest of E. Keller Houser, received in 1944, the income to be used to endow a room in memory of his daughter, Anna Victoria Houser.....	2,500.00
KAUFFMAN HOSPITAL FUND—Gift of Samuel H. Kauffman in 1954, the income to be used for the hospital.....	1,000.00
KIMMEL HOSPITAL FUND—Bequest of Annie Kimmel, received in 1932, the income to be used for the hospital.....	3,080.00
KUHLBANK HOSPITAL FUND—Bequest of Freda Kuhlbank, received in 1930, the income to be added to the principal until the principal shall be large enough to maintain a bed in the White Ward of the hospital to be known as the "Freda Kuhlbank Bed".....	2,025.00

MALONEY HOSPITAL FUND—Created in 1952 by the Maloney Concrete Co., the income to be used for the hospital...	5,000.00
NATIONAL PARK SEMINARY HOSPITAL FUND—Gift of students of National Park Seminary of Forest Glen, Maryland, in 1906, the income to be used toward the maintenance of a bed in the hospital.....	500.00
PATIENT AID HOSPITAL FUND—Created in 1956 by an anonymous donor, the income to be used to provide hospitalization to needy persons suffering from diseases, especially heart disease.	106,170.00
REINHARDT HOSPITAL FUND—Bequest of Luisa Wynne Reinhardt in 1922, the income to be used for the hospital....	500.00
STRONG HOSPITAL FUND—Gift of estate of Hattie M. Strong in 1952 the income to be used for the hospital.....	15,000.00
TREE HOSPITAL FUND—Created in 1911 by bequest of Lambert M. Tree, in memory of his mother, Mrs. Laura M. Tree, the income to be used to maintain a bed in the hospital, to be known as the "Laura M. Tree Bed"	10,000.00
WOODBURY HOSPITAL FUND—Bequest of Ellen DeQ. Woodbury in 1909, the income to be used for the treatment of female patients in the hospital.....	10,000.00

HOSPITAL EQUIPMENT FUNDS

MARVIN, DOROTHY BETTS, HOSPITAL EQUIPMENT FUND—Created in 1954 by the Women's Board of the Hospital, the income to be used for the purchase of equipment.....	60,651.00
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DESCRIPTION OF ENDOWMENT FUNDS (Continued)

August 31, 1960

PLANT FUNDS

GRADUATE ENDOWMENT FUND—Created by the Class of 1926, to be used for the acquisition of sites, erection of buildings, and maintenance and purchase of equipment. Only the income may be used until Fund reaches \$50,000 when income, and principal over \$50,000, may be used.....	15,736.00
NATIONAL UNIVERSITY LIBRARY FUND—Created in 1955 by transfer of the assets of National University, the income to be used toward the maintenance and extension of the Law Library.....	18,390.00
SCHOUER NATIONAL UNIVERSITY LIBRARY FUND—Bequest of James Schouler in 1921 to the National University Law School, the income to be used to purchase books for the Law Library.....	1,520.00

LIBRARY BOOK FUNDS

GLADSTONE LIBRARY FUND—Gift of Ethel S. Gladstone in 1951, the income to be used to purchase books for the Library.....	175.00
GREEN LIBRARY FUND—Gift of the William Green Memorial Fund, the income to be used to purchase books in the field of Social Sciences for the Library.....	20,000.00
HENSEY-TROUTMAN LIBRARY FUND—Created in 1951 by D. C. Masonic Clubs and added to in 1957 by bequest of Lynn H. Troutman, the income to be used to purchase books for the Library.....	500.00
HOWARD LIBRARY FUND—Gift of Colonel Deane Childs Howard in 1943 in memory of Captain Deane Childs Howard, Jr., the income to be used to purchase books for the Library.....	10,000.00
MEYER LIBRARY FUND—Gift of Eugene Meyer in 1944, the income to be used to purchase books for the Library.....	1,000.00
NOYES LIBRARY FUND—Bequest of Theodore W. Noyes, received in 1947, the income to be used to purchase books for the Library.....	10,000.00
PREWITT LIBRARY FUND—Gift of Lillian Prewitt Goodknight in 1960, in honor of her father, Dr. George Thompson Prewitt, President of the Class of 1895, the income to be used to purchase books for the School of Medicine Library.....	5,000.00
SWISHER ALCOVE BOOK FUND—Gift of Dr. Charles Clinton Swisher in 1941, in trust for the Historical Society of the University, the income to be used to purchase books for the Swisher Alcove in the Library.....	2,130.00

SCHOLARSHIP FUNDS

ANDREWS MEMORIAL SCHOLARSHIP FUND—Gift of Belle Fisk Andrews in 1920 in memory of her husband, Byron Andrews, the income to be used for scholarships "for ambitious and needy students of English, Latin, journalism, history, literature, or political science".....	5,195.00
BARTSCH SCHOLARSHIP FUND—Created by Dr. Anna Bartsch-Dunne in 1946, the income to be used for a scholarship for a woman in the School of Medicine and an internship for a woman in the University Hospital.....	20,040.00
BRADLEY SCHOLARSHIP FUND—Bequest of Alice Bradley in 1954 in memory of Everett Lamont Bradley, the income to be used for a scholarship in the School of Medicine.....	2,760.00
BRITTEN SCHOLARSHIP FUND—Bequest of Alma Hand Britten in 1959 to be known as the Frederick Albert and Alma Hand Britten Scholarship Fund, the income to be used for scholarships in the School of Engineering.....	257,260.00
CARR SCHOLARSHIP FUND—Created by the bequest of Emma K. Carr in 1932, the income to be used for scholarships for young white men.....	48,610.00
CARTER, H. H., SCHOLARSHIP FUND—Gift of Maria M. Carter in 1896 in memory of her husband, Henry Harding Carter, the income to be used for scholarships in civil engineering.....	5,000.00
CARTER, M. M., SCHOLARSHIP FUND—Gift of Maria M. Carter in 1871, the income to be used for scholarships for young men.....	1,000.00

DESCRIPTION OF ENDOWMENT FUNDS (Continued)

August 31, 1960

SCHOLARSHIP FUNDS (Continued)

COLUMBIAN WOMEN SCHOLARSHIP FUNDS

BRIGGS SCHOLARSHIP FUND—Bequest of Victoria Briggs Turner in 1959, to be known as the Victoria Briggs Scholarship, the income to be used for scholarships.	500.00
BROWN SCHOLARSHIP FUND—Created by the College Women's Club of Washington, D. C., in 1925, in memory of Elizabeth V. Brown, the income to be used for scholarships in the School of Education.	1,200.00
CHAMBERLIN SCHOLARSHIP FUND—Created by the Columbian Women of The George Washington University in 1932 in memory of Grace Ross Chamberlin, the income to be used for scholarships for young women.	2,300.00
COLLEGE WOMEN'S SCHOLARSHIP FUND—Gift of the College Women's Club of Washington, D. C., in 1926, the income to be used for scholarships.	500.00
FOUNDERS OF COLUMBIAN WOMEN SCHOLARSHIP FUND—Created by the Columbian Women of The George Washington University in 1920, the income to be used for scholarships for women in Columbian College.	5,000.00
HARDY FOUNDATION SCHOLARSHIP FUND—Created in 1957 by gift of Rose Lee Hardy Foundation, the income to be used for scholarships.	2,000.00
HERRON SCHOLARSHIP FUND—Created by the Columbian Women of The George Washington University in 1925 in memory of Lillian Young Herron, the income to be used for scholarships for women in Columbian College.	5,000.00
KNAPP SCHOLARSHIP FUND—Gift of the Columbian Women of The George Washington University in 1915 in memory of Nellie Maynard Knapp, the income to be used for scholarships for women.	5,000.00
McWILLIAMS SCHOLARSHIP FUND—Bequest of Janet McWilliams, former president of Columbian Women, to the Columbian Women of The George Washington University, transferred to The University in 1954, the income to be used for scholarships.	1,000.00
WILSON SCHOLARSHIP FUND—Gift of Elizabeth Wilson in 1926 in memory of her parents, Lewes D. and Myrtie H. Wilson, the income to be used for scholarships in the School of Medicine.	1,000.00

DAVIS SCHOLARSHIP FUND—Gift of Isaac Davis in 1869, the income to be used for scholarships.....	1,000.00
D. C.—D. A. R. SCHOLARSHIP FUND—Created in 1952 by the D. C.—D. A. R., the income to be used for scholarships for descendants of patriots of the American Revolution.....	9,730.00
DORSEY SCHOLARSHIP FUND—Created in 1947 by Harryman Dorsey in memory of Charles Worthington Dorsey, the income to be used for scholarships.....	14,484.00
DRANE SCHOLARSHIP FUND—Bequest of Estella Constance Drane in 1957, the income to be used for a scholarship in the Department of Arts and Sciences, to be awarded to a graduate of Roosevelt High School.....	5,000.00
ERWIN SCHOLARSHIP FUND—Gift of Helen B. Erwin in 1955 in memory of Henry Parsons Erwin, the income to be used for a scholarship in the School of Engineering.....	5,000.00
FARNHAM SCHOLARSHIP FUND—Gift of Mrs. Robert Farnham in 1871, the income to be used for scholarships in Columbian College.....	1,000.00
FISHER SCHOLARSHIP FUND—Bequest of Esther Brigham Fisher in 1951, the income to be used for scholarships.....	1,000.00
GREEN SCHOLARSHIP FUND—Gift of the Alpha Theta Chapter of Pi Lambda Theta Sorority in 1959, in memory of its founder and first president, Mildred Green, the income to be used for an annual scholarship for a woman student in the field of education.....	3,474.00
HAMPEL SCHOLARSHIP FUND—Gift of Evelyn Hampel Young in 1948 in memory of her mother, Anna Spickel Hampel, the income to be used for scholarships for married women in the School of Education or Columbian College.....	500.00
HARVEY SCHOLARSHIP FUND—Bequest of Emma Elizabeth Harvey in 1923, in memory of her daughter, Elma Lewis Harvey, the income to be used for scholarships in Columbian College for young women of the Protestant faith and of the Caucasian race.....	4,651.00
HAZELTON SCHOLARSHIP FUND—Bequest of Lillie S. Hazelton in 1950, the income to be used for scholarships.....	5,000.00
KENDALL SCHOLARSHIP FUND—Gift of Amos Kendall in 1869, the income to be used for a scholarship now designated by the Board of Trustees as one of the two High School Scholarships assigned to Western High School.....	5,960.00

DESCRIPTION OF ENDOWMENT FUNDS (Continued)

August 31, 1960

SCHOLARSHIP FUNDS (Continued)

MORHOUSE SCHOLARSHIP FUND—Created by A. Morehouse in 1861, the income to be used for scholarships for undergraduates intending to enter the Christian ministry.	1,500.00
PEARSON SCHOLARSHIP FUND—Bequest of Paul Pearson in 1944, the income to be used for scholarships in the School of Pharmacy.	2,840.00
PHI DELTA DELTA FRATERNITY SCHOLARSHIP FUND—Created by Phi Delta Delta Fraternity in 1957, the income to be used for a scholarship for a woman student in the first year law class.	1,000.00
POWELL SCHOLARSHIP FUND—Created by Levin M. Powell in 1886, the income to be used to train young men for entrance in the United States Naval Academy.	50,000.00
SHEPARD SCHOLARSHIP FUND—Bequest of Lula M. Shepard in 1946, the income to be used for scholarships in the School of Government.	10,000.00
SPENCER SCHOLARSHIP FUND—Created by Louisa J. Spencer in 1918, the income to be used for scholarships.	7,422.00
STONE SCHOLARSHIP FUND—An anonymous gift in 1893 in memory of Mary Lowell Stone, the income to be used for scholarships for women students of science in Columbian College.	2,000.00
SWISHER SCHOLARSHIP FUND—Created by Dr. Charles Clinton Swisher in 1941, the income to be used to award scholarships in medieval history.	15,497.00
WALKER SCHOLARSHIP FUND—Gift of William Walker in 1824, the income to be used for scholarships for undergraduates intending to enter the Christian ministry.	2,500.00
WITTINGTON SCHOLARSHIP FUND—Gift of the New York Baptist Theological Seminary in 1830, on behalf of John Wittington, the income to be used for scholarships.	1,960.00
WOODRUL SCHOLARSHIP FUND—Bequest of Ellen M. E. Woodhull in 1921, the income to be used for scholarships in Columbian College.	600.00

PRIZE FUNDS

BURNS MEMORIAL AWARD FUND—Gift of Persia Burns in 1937 in memory of her son, Byrne Thurtell Burns, the income to be used for an annual award in chemistry.....	1,000.00
COWLES PRIZE FUND—Created in 1943 by John Henry Cowles, the income to be used for annual awards in the School of Government.....	3,000.00
CRESSANT PRIZE FUND—Bequest of DeWitt Clinton Cressant in 1941, the income to be used to award an annual prize for excellence in dramatics or dramatic studies.....	1,000.00
CUTTER PRIZE FUND—Gift of Marion Kendall Cutter in 1902, in memory of E. K. Cutter, the income to be used for an annual award for excellence in the study of English.....	1,000.00
DAVIS PRIZE FUND—Gift of Isaac Davis in 1847, the income to be used for annual awards to members of the senior class who have made the greatest progress in elocution since their connection with the University.....	700.00
ESSARY PRIZE FUND—Gift of Helen Essary Murphy in 1948 in memory of her late husband, Jesse Frederick Essary, the income to be used for an annual award in journalism.....	3,000.00
EVANS MEMORIAL AWARD FUND—Created in 1937 by friends of Joshua Evans III, the income to be used to establish a prize, as a memorial to an "outstanding life," to be awarded annually "to that man in the graduating class who has demonstrated his signal ability in the social and political sciences and who has given promise of the interpretation of that ability in good citizenship among his fellows".....	1,800.00
FITCH PRIZE FUND—Gift of James E. Fitch in 1883 in memory of Willie E. Fitch, the income to be used for an annual award to a senior student for the best general examination in chemistry.....	1,000.00
GLOVER PRIZE FUND—Created in 1957 by Charles C. Glover, Jr., in memory of his great-grandfather, Charles Glover, the income to be used for an annual award to the student in the Law School who has attained the highest average grade in the third-year, full time course.....	2,000.00

DESCRIPTION OF ENDOWMENT FUNDS (Continued)

August 31, 1960

PRIZE FUNDS (Continued)

GODDARD PRIZE FUND—Gifts of Mary W. Goddard, Alice Douglas Goddard, and Frederick J. Goddard, in 1923, in memory of Morgan Richardson Goddard, Edward Carrington Goddard, and James Douglas Goddard; added to in 1941 by a gift of Frederick J. Goddard in memory of Alice Douglas Goddard. The income shall be used to award four cash prizes annually to the students making the highest averages in commerce, French language and literature, pharmacy, and American literature, respectively.	5,520.00
HORWITZ PRIZE FUND—Gift of Dr. Alec Horwitz, the income to be used for an annual award to a senior student in the School of Medicine who has demonstrated exceptional proficiency in the field of surgery.	2,500.00
HUBBARD PRIZE FUND—Gift of Gertrude M. Hubbard in 1907 in memory of her husband, Gardiner G. Hubbard, the income to be used for an annual award for excellence in American history.	1,000.00
KAPPA BETA PI LEGAL SORORITY PRIZE FUND—Gift in 1958 of Eta Chapter of Kappa Beta Pi Legal Sorority, the income to be used for an annual award to the woman student who attains the highest average in her freshman year.	350.00
LARNER PRIZE FUND—Bequest of John B. Larnier in 1933, the income to be used for an annual award in the Law School	800.00
MAHLER PRIZE FUND—Gift of Martin Mahler in 1953, the income to be used for the "Martin Mahler Prize in Materials Testing".	100.00
ORDRONAUX PRIZE FUND—Bequest of John Ordronaux in 1909, the income to be used for annual awards in the Law and Medical Schools.	5,000.00
RUGGLES PRIZE FUND—Gift of William Ruggles in 1859, the income to be used for an annual award for excellence in mathematics.	500.00

STAUGHTON-ELTON PRIZE FUND—Created by gift of Romeo Elton of Exeter, England, in 1860, the income to be used for annual awards for excellence in the Latin and Greek languages, one to be called the Staughton Prize in Latin, the other the Elton Prize in Greek.....	500.00
STERRETT PRIZE FUND—Gift of the Reverend J. MacBride Sterrett in 1911 in memory of his son, J. MacBride Sterrett, Jr., the income to be used for books to be awarded annually to the student attaining the highest average in general physics.....	300.00
SWISHER PRIZE FUND—Gift of Charles Clinton Swisher in 1941, the income to be applied yearly to enlarging the sum set apart for the Historical Prize established in his name by the Historical Club, December 7, 1936.....	1,000.00
WALSH PRIZE FUND—Gift of Thomas F. Walsh in 1901, the income to be used for an annual award for the best essay on some topic in Irish history.....	1,000.00
WEDDELL PRIZE FUND—Gift of Virginia Chase Weddell in 1923, the income to be used to award annually the Alexander Wilbourne Weddell Prize to the student submitting the best essay upon the general subject of the promotion of peace among the nations of the world.....	5,000.00

RESERVES FOR PROTECTION OF INVESTMENTS OF ENDOWMENT FUNDS

RESERVE FOR PROTECTION OF CONSOLIDATED ENDOWMENT FUNDS INVESTMENTS—Created from gains arising from the sale of investments and a portion of the net income of Consolidated Endowment Funds Investments.....	113,678.91
RESERVE FOR PROTECTION OF SCOTTISH RITE ENDOWMENT FUND INVESTMENTS—Created from gains arising from the sale of Scottish Rite Investments.....	56,570.36

DESCRIPTION OF PLANT FUNDS

August 31, 1960

FIELD HOUSE FUND—Created by the Class of 1946 to assist in building a field house. 3,116.69

FORD FOUNDATION HOSPITAL BUILDING FUND—Gift of the Ford Foundation for additional hospital construction. 255,754.88

HOSPITAL EQUIPMENT FUNDS

Cancer Clinic—Beta Gamma Phi Sorority.	437.31
Cancer Clinic—Zito.	406.79
Cardiovascular.	392.15
Multiple Sclerosis.	44.00
Obstetrics and Gynecology.	5,516.20
Physical Medicine.	9,640.95
Wolfe Ophthalmology.	31,088.05

LAW CENTER FUND—Created in 1945 by various donors, to be used for the acquisition of land and the erection of a building for the use of the Law School. 160,697.36

HOSPITAL BUILDING FUND—Gifts of various donors for additional hospital construction. 29,477.74

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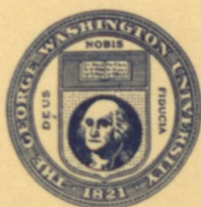
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BULLETIN

SUMMARIES OF
DOCTORAL DISSERTATIONS

1960



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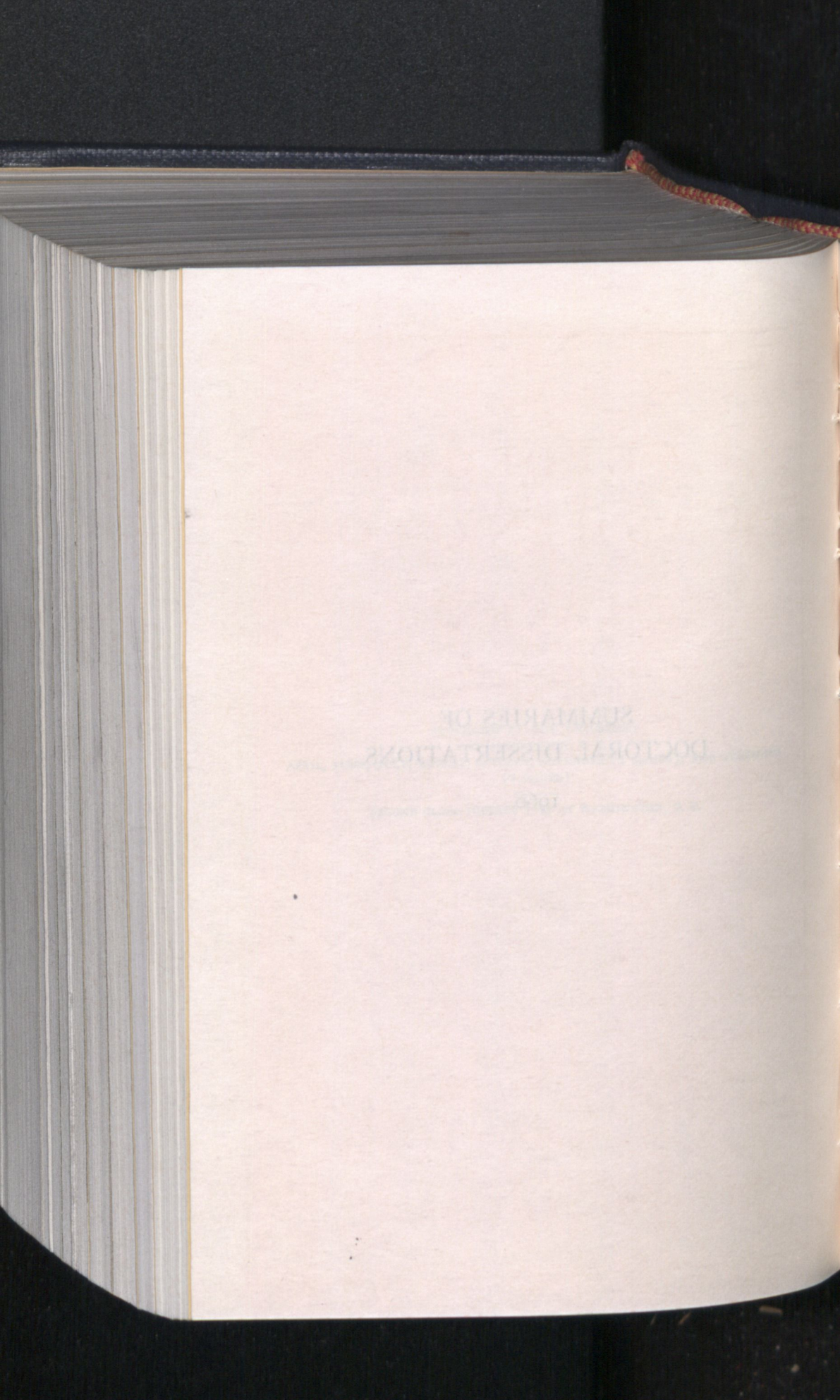
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Vol. 1

SUMMARY OF
DOCTORAL DISSERTATIONS

WASHINGTON, D. C.

BY THE UNIVERSITY

PREFATORY NOTE

This number of the University BULLETIN contains summaries of the dissertations which have been accepted during 1960, in partial satisfaction of the requirements for the degrees of Doctor of Philosophy, Doctor of Education, and Doctor of Business Administration at The George Washington University.

AVAILABILITY OF DISSERTATIONS

The dissertations in typescript form are filed in the University Library, where they may be consulted by students interested in examining the complete texts.

Information about interlibrary loans or photoprint and microfilm copies of dissertations listed in this and earlier issues may be obtained from the University Librarian.

EXPLANATORY NOTE

The University of the United States has been authorized to publish this translation of the original text of the report of the Commission on the Causes and Prevention of the War of 1898. The original text is in Spanish and is published by the Government of the United States.

THE UNIVERSITY OF THE UNITED STATES

The Commission on the Causes and Prevention of the War of 1898 was organized by the President of the United States in 1898. The Commission was composed of members of the United States Army, Navy, and Marine Corps, and of members of the United States Government. The Commission was authorized to investigate the causes and prevention of the War of 1898, and to report to the President of the United States.

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SUMMARIES OF DISSERTATIONS
SUBMITTED FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY

A STUDY OF THE EFFECTIVENESS OF COUNSELING AND PSYCHOLOGICAL TESTING SERVICES FOR "LEGALLY BLIND" ADULTS IN A REHABILITATION SETTING

by MARTIN DISHART*

The writer's objective was to set up as expeditiously as possible an effective program of psychological services, which he could conduct, to help adult "legally blind" clients at the Columbia Lighthouse for the Blind achieve as much as possible in their rehabilitation programs. These services included group, individual, and family counseling which were received by 60 blind clients during two years. The services also included a testing program, with a specially designed Psychological Profile form, utilized for 93 clients during the same two years. All services were cooperatively coordinated with each client's total rehabilitation program.

The problem in this study was to evaluate what good or harm the services did for the clients.

The "good" or "harm" evaluated for counseling services was in terms of its effect on specified items and areas of adjustment for each client. The "good" or "harm" evaluated for testing services was in terms of the agreement of 24 items of information in each client's Psychological Profile with previously established validity criteria.

There were three sources of evaluations in this study: the respective clients, the Columbia Lighthouse staff and their official records, and each client's respective Department of Vocational Rehabilitation counselor and his official records.

Counseling was evaluated by the respective clients, Lighthouse staff, and rehabilitation counselors, all evaluating the same factors of adjustment. Testing was evaluated by the Lighthouse staff and rehabilitation counselors, evaluating the same Profile information.

Background literature and previous research were presented as a framework for the counseling and evaluation procedures used in this study. Previous literature and research were also included as bases for using the tests, interpretation procedures, and evaluative designs for the testing services in this study.

Counseling services were evaluated, as they existed in the actual Lighthouse rehabilitation program, by the regularly used and professionally accepted evaluation procedures. Testing services were evaluated by comparisons with previously established, professionally accepted, and regularly used criteria.

* B.S. 1950, College of the City of New York; Ph.D. conferred February 22, 1960. Professor in charge of research: Mitchell Dreese, *Professor of Educational Psychology*.

Results of the study showed that the three sources of evaluations ascribed definite helpfulness, in all evaluated areas of adjustment, to the effects of counseling services received by the 60 subjects. However, the amount of such help could not be determined with statistical reliability. But statistical findings suggested that a client helped in one area of adjustment would probably be similarly helped in the other four areas of adjustment evaluated in the study.

The study showed no significant differences in the evaluations of counseling subjects when considered by sex. However, there were some evidences that Negro clients thought they were helped more by counseling than did the white clients, especially in certain areas of adjustment.

Subjects with less vision thought they were helped more by counseling. There was inconclusive evidence that subjects with "motion perception" may be exceptions who are helped least because of special adjustment problems.

A majority of 35 subjects who evaluated the three counseling services said that group counseling helped the greatest number of adjustment items while individual counseling was the most valuable. However, a large minority thought that group counseling was the most valuable. And 8 per cent of the 60 subjects thought the counseling of their families was the most valuable service. None of the subjects indicated that counseling had no values for them.

Twenty-five clients given a choice of group and family counseling overwhelmingly picked their group as the most valuable and helpful. However, this part of the study was considered to have very limited validity for several reasons. However, it did show that these subjects also all ascribed value to some service and that 8 per cent thought family counseling was most valuable.

Regarding the evaluation of testing services for 55 subjects.—The Lighthouse staff and rehabilitation counselors ascribed agreement between the Profile information and the respective validity criteria by indices of 1.52 (using a range of ± 2) or higher for all areas of information. Thus the testing information was generally congruous with the validity criteria of both sources. However, the degree of agreement could only be generally ascertained because of the limited reliability of judgments within each area of information. However, there was statistical reliability in assuming fairly similar agreement with the respective validity criteria among the six areas of information.

The vocational rehabilitation counselors indicated that having the test information made their counseling "much more helpful" to 87.1 per cent and "more helpful" to 11.6 per cent of their respective 93 clients. They indicated that it made counseling less helpful to only 1.1 per cent of the 93 subjects.

The rehabilitation counselors also indicated that the amount of Profile

information in each area was adequate for 96.9 per cent of the 93 subjects and superfluous for none.

CONCLUSIONS

The following conclusions from this study warrant consideration:

1. The validity criteria utilized for these evaluations were far from perfect. However, they seemed the best available and yielded important information.
2. The counseling services in this study were judged definitely helpful to the 60 subjects, to an approximately similar degree in the five areas of adjustment. However, the amount of helpfulness could not be reliably determined.
3. The evaluations of counseling by subjects did not differ with sex. But there were evidences that the Negroes thought they were helped more than did the white clients, especially in certain adjustment areas.
4. Subjects with less vision thought they were helped more by counseling services. An exception with special problems may be clients with "motion perception".
5. It can be reasonably assumed that group and individual counseling will be found helpful by most blind rehabilitation clients similar to those in this study. A few will also find family counseling very important. None of the subjects indicated that counseling had no value. There was no evidence of major differences among areas of adjustment in the number of items helped by counseling. But it is likely that certain items of adjustment had greater importance for some clients than other items. It is also very possible that counseling services helped items of adjustment not included in the questionnaire.
6. Psychological Profile information for 55 subjects can be assumed to be in general agreement with both sources of validity criteria. However, the amount of such agreement could not be reliably ascertained although it would probably be relatively similar for the six areas of information.
7. Rehabilitation counselors indicated that the testing information made their counseling "more helpful" to all but about 3 per cent of their 93 clients. It made their counseling "less helpful", i.e., probably because of testing inaccuracy, to only 1.1 per cent of the 93 subjects and the negative effect was only for the area of information concerning manual dexterities.
8. The rehabilitation counselors indicated that the amount of Profile information in each area was adequate for nearly all 93 subjects and was not superfluous for any of them.
9. The writer felt that the study indicated positive values for the co-operative coordination of all psychological services.

Recommendations for Future Studies

The following considerations are suggested for related further studies:

1. An important limitation in this study was the problem of evaluating the effects of counseling services on adjustment in a setting where other services also undoubtedly influenced adjustment. It is therefore suggested that similar counseling services for blind subjects be studied in settings where the client does not receive other services; for example, clients awaiting placement, or clients who already graduated from a rehabilitation program where counseling was not included. Under such conditions equated control groups and "before and after" evaluations could be considered. Also under such conditions evaluative tests of personal adjustment could be utilized; such tests could not be used in this study because with no controls there would be no way to separate the influences of counseling from the influences of the other services.

2. A major restriction on the evaluation of testing services in this study was the fact that the Psychological Profiles of all 93 subjects were the work of this writer. There are no data about the same testing services conducted by someone else. Since the Profile information is actually the examiner's interpretation of testing results, it would seem of prime importance to evaluate Psychological Profiles by many examiners using the same tests and procedures with similar groups of blind subjects.

It would seem very desirable to arrange for such testing procedures in agencies for the blind in several geographical locations. In addition to evaluation information, the compilation of such data in one central place would be useful for further studies.

3. The literature contains many contentions that there is no special "psychology for the blind"; that counseling services which help the blind are not much different from services which could help anyone with a severe disability. It would therefore seem worthwhile to evaluate similar counseling services for rehabilitation subjects with other disabilities.

4. Any study can be improved by better control of influencing variables. In this study such variables were: (1) there were different intervals between counseling services and evaluations of their effects. (2) There were different intervals between testing services and evaluations. The range in both these cases was nearly two years. (3) As already described, 25 of the 60 counseling subjects had unscheduled individual counseling and had to evaluate the "most valuable" service differently.

5. Evaluations of the effects of counseling services on the adjustment of blind subjects should be conducted with counselors other than the writer. A study similar to this might show different effects of counseling conducted by someone else.

6. It has already been noted that the Lighthouse services such as "travel training", shop, Braille, and home economics probably affected

clients' adjustments along with counseling services. However, it might also be possible that the adjustments effected by counseling services improved clients' performances in these skills. An interesting study would be to:

- a) Evaluate blind clients' performances in specified rehabilitation areas such as cane travel, shop, Braille, and orientation.
- b) Allow a 10-week "wait" period during which no special services are received.
- c) Evaluate the same performances a second time
- d) Provide a program of counseling services for 10 weeks
- e) Evaluate the same performances a third time
- f) An equated control group receiving equal attention but no counseling services could improve the validity of results.

This kind of study might supply information about the often considered possibility that the performance abilities of blind people can be helped by counseling services. In such studies it is highly desirable to have as large a number of subjects as possible.

HARVEY W. WILEY: THE FORMATIVE YEARS

by WILLIAM LLOYD FOX*

It is a gratifying historical fact that every stressful situation to which the American people has been subjected has produced a competent leader. The reform for purity in foods and drugs was no exception.

Walter G. Campbell, *In Memoriam:*
Harvey Washington Wiley, 1930

Country school teacher; Civil War volunteer; nonpracticing physician; agricultural chemist; university professor; government bureau chief; twice president of the American Chemical Society; Redpath lecturer; Director of the Bureau of Foods, Sanitation, and Health of *Good Housekeeping Magazine*; and Father of the famous federal Food and Drug Act (1906)—these roles comprised some of the more important facets of the long and varied life of Dr. Harvey Washington Wiley (1844–1930) who lived in Indiana until 1883, at which time he became the Chief Chemist of the United States Department of Agriculture, a post he occupied for twenty-nine years.

In spite of the varied facets of his long and active career, there was a striking consistency and unity in his life in which its early stages remarkably forecast the characteristics of its later ones. Indeed, one cannot well understand the attitudes and achievements which were to gain him lasting fame as a key figure in the Progressive Period of the early 20th century without carefully examining the preceding six decades of his career. It is the purpose of this study to trace the long preparatory stages in necessary detail.

Born on October 18, 1844, in a log cabin on a farm in Jefferson County, Indiana, just a few miles from the Ohio River, Wiley was the sixth of seven children, all but one of whom survived infancy. Perhaps Wiley's first recollection of his childhood days was being taken by his father to the subscription school where the latter taught. In order not to have any interference from young Harvey, Preston Wiley would draw with chalk a square on the floor and put the little boy in it, admonishing him not to move out of the chalked enclosure.

Before Wiley enrolled at Hanover College in the spring of 1863, he had had no more than four short winters of schooling. Since he was deficient in Latin and Greek, the president of the college, Dr. James Wood, placed him in the preparatory class. The following November, the young farm boy, who realized that he knew very little but was eager to learn, was permitted to enter the freshman class.

Since it was necessary that he keep his college expenses at a minimum,

* A.B. 1943, A.M. 1945, Western Reserve University; Ph.D. conferred February 22, 1960. Professor in charge of research: Wood Gray, *Professor of American History*.

Wiley did his own cooking, his diet being a monotonous one of bread, molasses, mush, pies, and occasionally meat. Two months after he came to the college he noted that he was not getting "the right kind of food to eat" and that his meals should include "all kinds of vegetables".

Early in 1864 Wiley was invited to join a Greek-letter fraternity. However, he declined the invitation since his father did not believe in secret societies. Throughout the rest of his life Wiley never joined any organization which had a secret ritual except the Grand Army of the Republic, and the only meeting of the G.A.R. he ever attended was the one in which he was initiated. He regarded secret societies as an unfortunate survival of the dark ages.

A college activity which young Wiley joined shortly after he arrived at Hanover was the Philalethean Society, one of the two literary societies and the one in which there were no Confederate sympathizers. In the spring of 1865 he read an essay before this group on the subject of health, it being a harbinger of his later interest and career.

For a farm boy attending in the 1860's a small, Indiana, church-related college, Wiley had a surprising lack of provincialism in thought and outlook. He seemed to be interested in a variety of subjects. Science, Shakespeare, religion, politics, and military affairs—he had a catholicity of interests.

Being too young to enlist when the Civil War began, Wiley, with his father, joined a local cavalry company of the Indiana Legion, a home guard unit, which became involved in the summer of 1863 in some military action when it gave chase to General John H. Morgan's Confederate raiders, who managed, however, to outdistance the Indiana defenders. But the following spring, with other Hanover students he enlisted for one hundred days in the 137th Regiment, Indiana Volunteer Infantry, which was sent to Tullahoma, Tennessee, an important supply depot on the railroad which connected General William T. Sherman's army with the North, for the purpose of protecting the vast military stores that were accumulated there. Wiley's tour of duty was relatively uneventful. When Corporal Wiley returned home, he was in poor health. His chronic diarrhea had not been cured, and everyone thought that he had tuberculosis. His mother nursed him back to health, so that with the coming of spring he was able to resume his studies at Hanover, having meanwhile studied for the sophomore examinations. The following fall he entered the junior class; and on June 20, 1867, he and eight other students including his brother received their degrees. Wiley's excellence as a student was shown by the fact that he graduated at the head of his class.

By the time Wiley had completed his baccalaureate program he had decided to take up medicine as his chosen profession. But he did not have the funds to begin his medical studies immediately. Late in October 1867, Wiley was appointed principal-teacher at Lowell in northern In-

diana and at sixty dollars a month for the four-month term. The black-bearded schoolmaster found time, however, for other things beside keeping school.

During the following summer the schoolmaster who wished to become a physician began to study medicine with his old friend from army days, Dr. S. E. Hampton, in Milton, Kentucky. In retrospect, Wiley believed that riding with Dr. Hampton when he made calls gave him a better insight into the practice of medicine than he could otherwise have received by studying solely from books. Although he enjoyed his brief medical apprenticeship with Hampton, he was happy to receive word from the secretary of the board of trustees of Northwestern Christian (now Butler) University in Indianapolis that he had been appointed tutor of Latin and Greek in the institution's preparatory school; for there was a new school of medicine in the city which would make it possible for him to continue his study of medicine. His salary had been handsomely doubled over what he had earned while teaching at Lowell. A year later he was tendered the chair of natural science while in the meantime he was busy studying at the new Indiana Medical College, from which he graduated in February 1871.

By the following June Wiley was anxiously trying to make plans to enter practice, but as it turned out he never did. Instead, he took a position as a general teacher and "first assistant" in the Indianapolis (now Shortridge) High School in order to acquire some capital before beginning to practice medicine. In the fall of 1871 he underwent six hours of teacher examinations in order to meet the state certification requirements. Except for geography and spelling he seemed to get through the examinations without much trouble. Spelling and handwriting, especially the latter, were never among Wiley's accomplishments—as numerous references of his own, his family, and his friends attest.

In the spring of 1872 he resolved to give up his high school position, to go to Harvard or Yale for a year of study which would be of special importance in view of his acceptance of the professorship of chemistry in Indiana Medical College.

The young teacher-physician had been able, meanwhile, to save some money even though his income was quite modest. Having bought some lots in Indianapolis, his first investment in real estate, he sold some of them at a profit during the summer before he left for Harvard. Thriftiness and prudence characterized his financial affairs then and throughout the rest of his life.

Not all of Wiley's time during this early period of his life was given to teaching, studying, and making investments in real estate. He had several *affaires de coeur* and carried on an especially ardent courtship with Sarah Fletcher. In addition, he had heard some of the well known lectures of

the day as well as concert artists including the famous Norwegian violinist Ole Bull.

Arriving in Cambridge on September 24, 1872, Wiley, who was almost twenty-eight years old, enrolled as a special student in Harvard's old Lawrence Scientific School. In order to undertake this venture, he had borrowed five hundred dollars from George Trinkle, a neighbor, to supplement his savings. From the very beginning of his sojourn in Cambridge the young physician was an enthusiastic Harvard man. However, in December he had to interrupt his studies and return to Indianapolis where, according to previous agreement, he was to teach a term at the Indiana Medical College. Returning to Cambridge late the following March, Wiley declared: "Here I am at last. Again in [the] Halls of Harvard. I had sometimes thought while away that I would never be back again. The time that I had been here seemed like a dream."

Certainly one of the most interesting phases of Wiley's brief career at Harvard was his standing for a bachelor's degree. Professor Josiah Cooke, the chairman of the chemistry department, suggested that if he would apply for a degree, he could get it by passing the necessary examinations. Accepting the suggestion he undertook during the course of the next five weeks the task of studying intensively for the examinations leading to the Bachelor of Science degree. He passed the six examinations and graduated *cum laude*.

When the young physician-chemist left Cambridge he had no definite plans for the immediate future; but shortly he accepted the chair of chemistry at Northwestern Christian University. This meant that he was to begin the academic year with two positions, one of which was teaching chemistry at the Medical College. Later in that year his labors were augmented with the addition of a third teaching position, this one being in the high school! Despite his busy schedule Wiley somehow found the time to prepare a very thoughtful paper on the sorry state of American medical education entitled "What Is Wanting" which he was to deliver before the graduating class of the Medical College in February 1874. As it happened, one of Wiley's colleagues read the paper for him, since he became acutely ill and on the date of the delivery was near the point of death.

In his paper Wiley argued that the physician-to-be should have "a thorough elementary education", that in order to improve the training of physicians more and longer sessions in the medical schools were necessary, and that this country made doctors too easily. It was the lack of instruction in psychology which Wiley found to be the chief weakness in medical education, and he charged the graduates to see to it that this deficiency be overcome before many years elapsed. In conclusion he urged that the physician "be a man of large culture and extended knowledge".

On February 19, 1874, Wiley had worked till noon, came home deathly

sick, and was put to bed. He did not get up again for thirty-one days, having remained in a state of unconsciousness for three weeks. His illness was diagnosed as cerebro-spinal meningitis, from which he almost died. He made a good recovery and was able to accept appointment the following summer as professor of chemistry in the newly established Purdue University, where he was to remain for nine years.

At Purdue Wiley not only taught chemistry and, later, physics also, he served as instructor of military science and sponsor for a short-lived literary magazine. During the last year or two of his tenure at the University he had additional responsibilities as state chemist. His interest in sugar chemistry was subsequently to bring him recognition.

Obtaining a leave of absence in June 1878, Wiley went to Europe with his oldest sister and two friends. His tour was climaxed by spending a little more than two months at the University of Berlin where he heard the renowned Virchow, Helmholtz, and Hofmann. During his sojourn in Berlin Wiley had the opportunity to work in Dr. Eugene Sell's Imperial Food Laboratory where he learned the value and use of the polariscope. Undoubtedly his interest in the adulteration of food and drink was intensified during the weeks he spent in Berlin.

By 1883 the Commissioner of Agriculture, Dr. George B. Loring, was desirous of finding a replacement for Dr. Peter Collier, the department's Chief Chemist. Upon the recommendation of Col. Norman J. Colman, publisher of *Colman's Rural World*, Loring offered the position to Wiley who was happy to accept—with the understanding, however, that if he were tendered the presidency of Purdue he would take it. On April 9, 1883, the Purdue professor, who had been working hard to line up support for his presidential candidacy, took the oath of office as Chief Chemist, reporting for active duty in June.

Wiley's work in the Division (later Bureau) of Chemistry was to fall under three headings: (1) sugar experiments with sorghum, sugar beets, and sugar cane, which had been begun before he arrived, for the purpose of making the United States self-sufficient in this regard; (2) investigations of food and beverage adulterations and publication of Bulletin 13 (*Foods and Food Adulterants*); and (3) efforts to secure passage of a federal pure food and drug law. It was with the first and third topics that Wiley had his chief difficulties.

The Chief Chemist did much to put the beet sugar and cane sugar industries of this country on a secure foundation, and he demonstrated that while fine yields of sugar could be made from sorghum, it was not profitable commercially to do so. Among other things, he pointed out the possibilities of the muck soils around Lake Okeechobee, Florida, for the cultivation of sugar cane and other crops.

From the Wright Bill of 1879 to the Food and Drug Act of 1906, there were 190 bills introduced in Congress which were designed to protect in

some way the consumer of food and drugs. By the time Theodore Roosevelt became president, Wiley knew only too well the obstructions which blocked the enactment of a general regulatory law, the only kind of measure which he believed would give real protection to the consumer. Yet he never permitted himself to despair of passage of such legislation.

Though Wiley never taught again full-time after he left Purdue, he was appointed in 1893 adjunct professor of agricultural chemistry in Columbian (now The George Washington) University, retaining faculty status for nearly twenty years. He enjoyed his association with the University and was glad to serve on the institution's athletic committee when President B. L. Whitman invited him to do so.

When Theodore Roosevelt became president on September 14, 1901, Harvey Wiley was in his nineteenth year as Chief Chemist. That fall he turned fifty-seven and, while occasionally bothered by sciatica, was in vigorous health. He was eager to see the enactment of a pure food law. "In time, it came to be said of him, as is usually said of crusaders, that he was extreme. The adjective caused no abatement of Wiley's crusading belligerency. He gave as good as he got." (Mark Sullivan, *Our Times*, II, p. 521.)

Here was a man who from his birth in 1844 to the elevation of Theodore Roosevelt to the presidency had enjoyed a full, active, and varied life. Farm boy, Union soldier, schoolteacher, university professor, scientist, businessman, and bureau chief—he had been all of these. His education was broad, and his enthusiasm for life included both the old and the new. Turning from the path of religious orthodoxy as a young man, he became a rationalist and materialist. By the end of the century, although lacking a home and family of his own, which he certainly wanted, he could take pride in his accomplishments in the Department of Agriculture, the Association of Official Agricultural Chemists which he helped to found, the American Chemical Society which he strove as president (1893-94) to increase in membership and prestige, and in his own research and writings. One can say that his life and professional attainments by 1901 were indeed a fitting preparation for, what in retrospect would be regarded as, his supreme accomplishment: leadership in securing the enactment of the renowned Food and Drug Act (1906) and in awakening this nation to the dangers of adulteration, the need for honest labeling, and the importance of wholesome food and drink.

Harvey Washington Wiley was a man big of hand, warm of heart, and brilliant of mind. The man and his career have been no better summed up than by the remark of an old associate of his in the Bureau of Chemistry: "He was big timber."

ON LINEAR SEQUENCE SPACES WHICH PERMIT OMISSION AND ADJUNCTION AND HAVE FINITE DIMENSION MODULO CONVERGENCE

by JAMES EDWARD HANSON*

I. SOME BASIC DEFINITIONS AND PRELIMINARY THEOREMS

The sequences $\{s_k^{(1)}\}$, $\{s_k^{(2)}\}$, \dots , $\{s_k^{(p)}\}$ are defined to be *linearly dependent mod* (C, O) if some linear combination of them with at least one nonvanishing coefficient is convergent. Otherwise, they are said to be *linearly independent mod* (C, O) . A determinant condition is given which, for bounded sequences, is necessary and sufficient for linear dependency mod (C, O) .

A sequence $\{s_k^{(1)}\}$ is defined to be related to a sequence $\{s_k^{(2)}\}$ with relationship R_1 if $\{s_k^{(1)}\}$ and $\{s_k^{(2)}\}$ differ by a convergent sequence. R_1 is shown to be an equivalence relation. Attention is then restricted to bounded sequences, and the class C of equivalence classes generated by R_1 is introduced. Thus, if $C \in C$ and $\{s_k\} \in C$, then C contains exactly those sequences which differ from $\{s_k\}$ by a convergent sequence. Addition and scalar multiplication of elements of C are well defined, and it is shown that C forms a vector space.

The class F of all rational functions of the complex variable z which have poles (if any) only at $z = 0$ is introduced. The transformations $T_{f(z)}$ for $f \in F$ are defined as operations on sequences as follows:

$\{s_k^{(2)}\} = T_{f(z)} \{s_k^{(1)}\}$, where $s_n^{(2)} = a_0 s_{n+q}^{(1)} + a_1 s_{n+q-1}^{(1)} + \dots + a_r s_{n+q-r}^{(1)}$, $n = 0, 1, 2, \dots$, where if any subscript is negative the term is taken to be zero, and where $f(z) = z^{-q} (a_0 + a_1 z + \dots + a_r z^r)$.

These transformations are considered as operators on elements of C , and are shown to be well defined. Several commutative and distributive laws are proved. The most important result of this section is:

If a class of bounded sequences has the properties

1. It is closed under addition and scalar multiplication.
2. It contains all convergent sequences.
3. It is closed under omission and adjunction. It can then be decomposed into equivalence classes of C , and the class of these

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equivalence classes forms a vector space closed under all operations $T_{f(x)}$ for $f \in F$. This class of equivalence classes is said to be a *translatory* vector space.

Finally, in this section, and also in Section II-VI, the field of scalars is understood to be complex.

II. ON FUNDAMENTAL EQUIVALENCE CLASSES

An element of \mathbf{C} is said to be *fundamental*, belonging to the value ρ , if it contains a sequence of the form $\{\rho^k d_k\}$, where $|\rho| = 1$, $\{d_k\}$ is bounded, and $\lim_{k \rightarrow \infty} (d_{k+1} - d_k) = 0$. If the sequence is also divergent, the element of \mathbf{C} is said to be *nontrivially fundamental*. It is shown that a nontrivially fundamental equivalence class belongs to only one value of ρ .

If $f \in F$ and C is nontrivially fundamental, then $T_{f(x)}C = f(\rho^{-1})C$, which is also nontrivially fundamental in the event that $f(\rho^{-1}) \neq 0$. Further, if Φ is a class containing a finite number of nontrivially fundamental equivalence classes, no two of which belong to the same value of ρ , then the elements of Φ are linearly independent.

The class of all equivalence classes which can be expressed as a finite linear combination of fundamental equivalence classes is denoted by \mathbf{B} . The class of all fundamental equivalence classes belonging to a given value of ρ is denoted by \mathbf{B}_ρ . It is shown that:

1. \mathbf{B} and \mathbf{B}_ρ are translatory vector spaces.
2. \mathbf{B} is properly included in \mathbf{C} .
3. \mathbf{B}_ρ is properly included in \mathbf{B} .
4. \mathbf{B} and \mathbf{B}_ρ have infinite dimension.

III. FINITE DIMENSIONAL TRANSLATORY VECTOR SPACES OF EQUIVALENCE CLASSES

A translatory vector space is shown to have finite positive dimension if and only if it has a basis of the form

$$C_{\rho_1, 1}, C_{\rho_1, 2}, \dots, C_{\rho_1, r_1},$$

$$C_{\rho_2, 1}, C_{\rho_2, 2}, \dots, C_{\rho_2, r_2},$$

$$\vdots$$

$$C_{\rho_n, 1}, C_{\rho_n, 2}, \dots, C_{\rho_n, r_n},$$

where $\rho_i \neq \rho_j$ for $i \neq j$, $i, j = 1, 2, \dots, n$, and $C_{\rho_{km}}$ belongs to ρ_k , $m = 1, 2, \dots, r_k$ for each k , $k = 1, 2, \dots, n$.

The dimension of the space is $r_1 + \dots + r_n$, and the *degree* is defined to be n . If the degree and the dimension are equal, the space is said to be *nonderogatory*. If V is of positive finite dimension, it is said to possess a *generator* if there exists an element $C \in V$ such

that every element of V can be expressed in the form $T_{f(z)}C$ for some $f \in F$. It is proved that V possesses a generator if and only if V is nonderogatory. Further, if $C \in B$ and $C \neq 0$, then $T_{f(z)}C$ generates a nonderogatory space as f ranges over all elements of F .

Let V be a finite dimensional translatable vector space of dimension $q > 0$ with degree n . Then there exists a polynomial $f \in F$, determined uniquely except for a nonzero scalar multiple, such that

1. The roots of $f(z) = 0$ are $\rho^{-1}, \dots, \rho_n^{-1}$ (defined above).
2. If $C \in V$, then $T_{f(z)}C = 0$.
3. Let $g \in F$. Then a necessary and sufficient condition that

$T_{g(z)}C = 0$ for all $C \in V$ is that $\frac{g}{f} \in F$.

This polynomial is called the *minimal polynomial* of V . Its roots, all distinct and of absolute value unity, are called the *eigenvalues* of V .

IV. ON CERTAIN DECOMPOSITIONS OF C

The principal results of this section are the following two theorems.

Thm. Let $\rho_1, \rho_2, \dots, \rho_n$ be distinct, all having absolute value unity. Then there exists a class $C' \subset C$ such that

1. C' is a translatable vector space.
2. If C_1 is a finite linear combination of fundamental equivalence classes, each of which belongs to one of the ρ_j 's, $j = 1, 2, \dots, n$, then C_1 does not belong to C' unless $C_1 = 0$.

3. If $C_2 \in C$, then C_2 can be uniquely expressed as the sum of an element of C' and an element C_1 as defined in 2 above.

Thm. Let V be a finite dimensional translatable vector space of dimension $q > 0$, with eigenvalues $\rho_1^{-1}, \dots, \rho_n^{-1}$, ($n \leq q$). Then there exists a class $C'' \subset C$ such that

1. C'' is a translatable vector space.
2. If C_1 is a finite linear combination of fundamental equivalence classes, each of which belongs to one of the ρ_j 's, $j = 1, 2, \dots, n$, then $C_1 \in C''$ if and only if $C_1 \in V$.

3. If $C \in C$, then one can find $C_2, C_{\rho_1}, \dots, C_{\rho_n}$ such that $C = C_2 + C_{\rho_1} + \dots + C_{\rho_n}$, where $C_2 \in C''$, $C_{\rho_j} \in B_{\rho_j}$, $j = 1, 2, \dots, n$, and $C_{\rho_j} \in V$ if and only if $C_{\rho_j} = 0$.

Other theorems which lead to the above theorems are also proved in this section, but it would be impossible to discuss them intelligently in the space allotted here. Suffice it to say that to arrive at the above two theorems requires rather intricate reasoning, employing in the proofs the well ordering hypothesis (equivalent to the axiom of choice).

V. THEOREMS CONCERNING REGULAR MATRIX METHODS OF EVALUABILITY

The principal concern of this section is with regular sequence to sequence matrix transformations such that the class of all bounded sequences which are evaluable by the matrix permits omission and adjunction. It is not assumed that sequences obtained by omission and adjunction are necessarily evaluable to the same value. This class has the properties described in the summary of Section I. The vector space formed by decomposing this class into equivalence classes is then translatable. Each element of the vector space is mapped by the matrix into the zero equivalence class.

It is shown that if this vector space has a nonzero dimension, then it has infinite dimension. It is also shown that if a bounded sequence is evaluable, then any sequence obtained from it by omission or adjunction is not only evaluable, which follows immediately, but evaluable to the same value. Furthermore, if $\{s_k\}$ is bounded and evaluable to the value S , and if $f \in F$, then the sequence $T_{f(s)} \{s_k\}$ is evaluable to the value $Sf(1)$. An interesting corollary is proved: If $\{s_k\}$ is evaluable, and if $\{s_k\}$ is expressible as a finite linear combination of nontrivially fundamental sequences, no one of which belongs to the value $\rho = 1$, and no two of which belong to the same value of ρ , then $\{s_k\}$ is evaluable to zero, and each of its summands is evaluable to zero.

Let M be a regular matrix method of the type under consideration, and let W be the translatable vector space of the elements of C which are mapped by M into the zero equivalence class. Assume W does not have zero dimension. Since, then, W has infinite dimension, we ask the question: If originally we considered a proper translatable subspace C_1 of C , instead of considering *all* bounded sequences, what can be said about C_1 in order that W restricted to C_1 have finite dimension? In particular, how large can C_1 be?

In line with these questions, we make the following definition: Let C_1, \dots, C_q be linearly independent, all belonging to C_1 , where $C_1 \subset C$, and C_1 is a translatable vector space. Let V be the vector space formed by all linear combinations of C_1, \dots, C_q . (Thus $V \subset C_1$). C_1 will be said to be *sympathetic* toward V if $C_1 \cap W = V$. (M has already been fixed in this definition.)

It follows that, for a given V , a necessary condition that there exist M and C_1 such that C_1 is sympathetic toward V is that V forms a finite (nonzero) dimensional translatable vector space.

It is further proved that, for a given V , a sufficient condition that such an M and C_1 exist is that none of the eigenvalues of V is unity. In this case, if $C \in V$, and $\{\sigma_k\} \in C$, then $\{\sigma_k\}$ is evaluable to the same value for all such M and C_1 .

A theorem which sheds some light on how large C_1 can be is the following: If M, V, C_1 are such that C_1 is sympathetic toward V , and if ρ^{-1} is an eigenvalue of V , then C_1 must exclude an infinite number of linearly independent elements of B_ρ , and W must contain an infinite dimensional subset of B_ρ .

It is then shown that if the eigenvalues of V are $\rho_1^{-1}, \dots, \rho_n^{-1}$, all distinct from unity, then one can find an M such that W consists exactly of all classes $C \in C$ which can be expressed as a finite linear combination of elements belonging to $B_{\rho_1}, \dots, B_{\rho_n}$, and thus $V \subset W$. (C_1 could be chosen to be V in this case, and C_1 is then clearly sympathetic toward V . It is not, however, the largest possible such C_1 .)

If M, V, C_1 are such that C_1 is sympathetic toward V , C_1 is defined to be *linearly maximal* if every element of C can be expressed as the sum of an element of C_1 and an element of W . For given V and M , if C_1 is linearly maximal then it is as large as possible, in the sense that if $C_2 \supset C_1$ and C_2 is sympathetic toward V , then $C_2 = C_1$.

It is then shown that if the eigenvalues of V are distinct from unity, one can find M and C_1 such that C_1 is linearly maximal. The exhibited M has the property that W is constructed as was discussed two paragraphs ago. C_1 is just the class C'' defined in Section IV.

Finally, an application to Nörlund mean methods is made in the following corollary: If M is a Nörlund mean method with $p_n = 0$ for $n > N$, then the class W is translatable. If $f(z) = p_0 + p_1 z + \dots + p_N z^N$, then W is as in the previous paragraph (of the Summary), where the ρ 's are the reciprocals of the roots of $f(z) = 0$ which have absolute value unity, unless W contains only the zero element. The latter case occurs if and only if $f(z) = 0$ has no roots of absolute value unity. If $f(z) = 0$ does contain roots of absolute value unity, then for any V constructed with the reciprocals of these roots, there exists a C_1 which is sympathetic toward V and is linearly maximal.

VI. ON BOUNDED SEQUENCES WITH A FINITE NUMBER OF LIMIT POINTS

The class of sequences of the above type obeys properties 1, 2, 3 discussed in Section I. The class L of the resulting equivalence classes thus forms a translatable vector space and $L \subset C$. It is shown that $L \cap B_\rho = 0$ if $\rho = 1$ or if $\rho = e^{2\pi i \lambda}$ for irrational λ . If $\rho = e^{2\pi i \lambda}$ with λ rational and $\rho \neq 1$, then $L \cap B_\rho$ has dimension 1, with a basis element containing the sequence $\{\rho^k\}$.

The following theorem categorizes finite dimensional translatory subspaces of \mathbf{L} : If \mathbf{V} is a finite dimensional translatory vector space included in \mathbf{L} and has positive dimension, then \mathbf{V} is nonderogatory, and none of its eigenvalues is unity. Further, the eigenvalues $\rho_1^{-1}, \dots, \rho_q^{-1}$, can be expressed in the form $\rho_1 = e^{2\pi i \lambda_1}, \dots, \rho_q = e^{2\pi i \lambda_q}$, where $\lambda_1, \dots, \lambda_q$ are rational. \mathbf{V} has a basis $\mathbf{C}_1, \dots, \mathbf{C}_q$, where $\{\rho_1^k\} \in \mathbf{C}_1, \dots, \{\rho_q^k\} \in \mathbf{C}_q$. Every such \mathbf{V} with the above properties is included in \mathbf{L} .

If \mathbf{M} is a regular matrix method which evaluates a divergent sequence, then the subclass of elements of \mathbf{C} which are mapped by \mathbf{M} into the zero element of \mathbf{C} has infinite dimension. If one restricts one's attention to \mathbf{L} , it is possible to have \mathbf{M} 's which map only a finite dimensional subspace of \mathbf{L} into the zero element. In this case, it is not then necessary to further restrict \mathbf{L} (as was required for \mathbf{C} , where \mathbf{C}'' was constructed) to achieve finite dimensionality.

Specifically, the following theorem is proved: Let $\{s_k^{(1)}\}, \dots, \{s_k^{(q)}\}$ be bounded and linearly independent mod $(\mathbf{C}, 0)$, each having a finite number of limit points. Then a necessary condition that there exists a regular matrix \mathbf{M} such that the class \mathbf{W} of all elements of \mathbf{C} evaluable \mathbf{M} is translatory, and such that the only sequences with a finite number of limit points which are evaluable \mathbf{M} are linear combinations of $\{s_k^{(1)}\}, \dots, \{s_k^{(q)}\}$ plus a convergent sequence, is that each of the $\{s_k^{(j)}\}$'s can be expressed as the sum of a periodic sequence and a convergent sequence.

Furthermore, if the $\{s_k^{(j)}\}$'s can be so expressed, then each of the $\{s_k^{(j)}\}$'s belongs to an element of \mathbf{B} , and the values to which the $\{s_k^{(j)}\}$'s are evaluated by \mathbf{M} are the same for any such \mathbf{M} . Also, if $\mathbf{C}_1, \dots, \mathbf{C}_q$ are the equivalence classes containing $\{s_k^{(1)}\}, \dots, \{s_k^{(q)}\}$, \mathbf{V}' the vector space generated by $\mathbf{C}_1, \dots, \mathbf{C}_q$, and \mathbf{V} the translatory space generated by $\mathbf{T}_{f(x)}$ operating on all elements of \mathbf{V}' as f varies over all elements of \mathbf{F} , then \mathbf{V} is finite dimensional, with dimension bigger than or equal to q . If there exists an \mathbf{M} , then \mathbf{V} has dimension q . Conversely, if \mathbf{V} has dimension q , then there exists an \mathbf{M} .

VII. WHEN THE FIELD OF SCALARS IS REAL

The purpose of this section is to recapitulate the first six sections when the field of scalars is real instead of complex. The analogous class to \mathbf{C} is denoted by \mathbf{C}_R . \mathbf{F} is replaced by \mathbf{F}_R , which is the class of all functions of \mathbf{F} with real coefficients. It is remarked that Section I carries over intact with no changes.

The definition of fundamental equivalence classes must be altered as follows:

An element of C_R is said to be *nontrivially fundamental over the reals* if it contains a divergent sequence $\{s_k\}$ of the following form:

$$s_k = d_k^{(1)} \frac{\rho^k + \rho^{-k}}{2} + d_k^{(2)} \frac{\rho^k - \rho^{-k}}{2i}, \quad k = 0, 1, 2, \dots \text{ where } |\rho| = 1,$$

$\{d_k^{(1)}\}$ and $\{d_k^{(2)}\}$ are bounded and real, and $\lim_{k \rightarrow \infty} [d_{k+1}^{(1)} - d_k^{(1)}] = \lim_{k \rightarrow \infty} [d_{k+1}^{(2)} - d_k^{(2)}] = 0$. The element will be said to belong to the value ρ (or ρ^{-1}).

If C is nontrivially fundamental over the reals, belonging to a value of $\rho \neq \pm 1$, let $f(z) = \frac{\rho^{-2} - \rho^2 + (2\rho - 2\rho^{-1})z}{i(1 - \rho^2)(1 - \rho^{-2})}$, let V be the one-dimensional vector space consisting of all real multiples of C , let $C' = T_{f(z)}C$, and let V' consist of all real multiples of C' . V' is called the *conjugate space* of V . The space consisting of all real linear combinations of elements of V and V' is called a *composite space*. It follows that every nonzero element of a composite space is nontrivially fundamental over the reals, that $(V')' = V$, that a composite space has dimension two and is translatable over the reals, and that the above composite space is the smallest translatable space over the reals which contains C .

If $\rho = 1$ or $\rho = -1$, the vector space of dimension 1 consisting of real multiples of C is called *self composite* and is translatable over the reals.

The structure of any finite dimensional translatable subspace of C_R (if its dimension is positive) is shown to be as follows:

There exists a finite set V_1, \dots, V_n of composite or self composite spaces such that:

1. Every element of V is expressible as a real linear combination of the elements of V_1, \dots, V_n ;
2. V has a basis consisting of nontrivially fundamental equivalence classes over the reals, these elements being the aggregate

of the bases of V_1, \dots, V_n . Thus $\dim V = \sum_{j=1}^n \dim V_j$.

The concepts of nonderogatory spaces, generators, degree, eigenvalues, and minimal polynomials can be seen to carry over to the real case in an obvious manner. The minimal polynomial has distinct roots of absolute value unity which occur in conjugate pairs, and has real coefficients. The analogues of B and B_ρ are also definable in an obvious manner. The theorems of Sections II and III carry over to the real case, provided they are restated in

the proper analogous form. The analogous theorems to the two principal theorems of Section IV are shown to be valid.

It is then remarked that Sections V and VI carry over in their entirety to the real field, provided they are stated in the proper analogous form.

Concerning Section VI, the following result is of further interest: If V is finite dimensional, of positive dimension, translatory, and such that each equivalence class of V contains a sequence with a finite number of limit points (everything restricted to be real), then V has a basis each element of which contains a sequence of the form $\{\cos 2\pi\lambda k\}$ or $\{\sin 2\pi\lambda k\}$, and for any λ , if one of the above sequences belongs to a basis element then the other belongs to another basis element, unless 2λ is an integer. Further, each such λ is rational, and integer values of λ are excluded. The dimension of V is odd if and only if there exists an element of V which contains the sequence $1, -1, 1, -1, \dots$

A STUDY OF THE *IN VITRO* TUBERCULIN LYSIS OF LEUKOCYTES FROM TUBERCULIN-HYPERSENSITIVE GUINEA PIGS

by BERNARD WILLIAM JANICKI*

Interest in delayed hypersensitivity has been high in the past mainly because of its close association with chronic infections. In addition to this interest to the clinician, the question of a basic mechanism different from that of immediate hypersensitivity has been a continual challenge for the immunologist. This combined interest has led to a renaissance in the study of delayed reactivity in the past fifteen years. The foremost contribution of recent research is the recognition of the fundamental role of the leukocyte in delayed hypersensitivity. Leukocytes from the tuberculin-hypersensitive host have been shown to be capable of passively transferring tuberculin sensitivity and to be specifically susceptible *in vitro* to the cytotoxic and cytolytic effect of tuberculin.

Normal guinea pigs were rendered hypersensitive to tuberculin by the intramuscular injection of heat-killed *Mycobacterium tuberculosis* (H37Rv) suspended in paraffin oil and the *in vitro* lysis of leukocytes from the sensitized animals by tuberculin was investigated. The cytotoxic phenomenon was measured by a microscopic count method and, in the later phase of the investigation, by a method based on the release of an intracellular, lysozyme-like, enzyme from lysed leukocytes. A comparative study of cytotoxicity by both methods demonstrated that the latter technique is an acceptable substitute for microscopic cell counts in measuring the *in vitro* lysis of sensitive leukocytes by tuberculin.

Studies on the "plasma factor" responsible for tuberculin leukocytolysis confirmed a previous report that it may be "shed" from leukocytes of sensitive animals during incubation in normal guinea pig serum. Chemical analyses of leukocytes from sensitized animals showed that they had a significantly higher content of protein than cells from normal animals. In addition, it was found that "plasma factor" is present in the circulation for only a short time. Significant levels of "plasma factor" were observed between 5 and 12 days after injection of guinea pigs with heat-killed tubercle bacilla. Attempts to demonstrate increased circulating levels of "plasma factor" after tuberculin skin testing of sensitized animals were inconclusive even though the susceptibility of leukocytes of sensitized animals to lysis by tuberculin apparently is enhanced following a tuberculin

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skin test. Efforts to correlate the presence of "plasma factor" with chemical alterations in sera from the "shedding" experiments and following sensitization provided suggestive evidence that the material may be an alpha globulin.

The disappearance of the "plasma factor" from the circulation after being present for only a short time is provocative. Possible explanations for this behavior of "plasma factor" include the participation of a blocking antibody to the tuberculin-"plasma factor" complex and fixation of "plasma factor" by adsorption to leukocytes or by combination with circulating antigen.

Fractionation of the unheated culture filtrate of the tubercle bacillus (H37Rv) yielded three protein and two polysaccharide fractions. Delayed-type reactions in sensitized animals were produced by the protein fractions and by the Polysaccharide II fraction. The B protein was the most active fraction followed by the C protein, A protein, and Polysaccharide II fractions in order of decreasing activity. The Polysaccharide I fraction evoked an immediate-type reaction in some sensitized animals. The gross features of this reaction suggested that it may be an Arthus-type response although attempts to transfer skin reactivity to Polysaccharide I passively with sera from sensitive animals have been inconclusive.

Cytolysis tests performed with these fractions showed that the Polysaccharide I fraction was the most active. The A protein fraction also was active. The other fractions were more active with sensitive leukocytes than with normal cells but the specific activity of these fractions was less than that obtained with the Polysaccharide I and A protein fractions. Subsequent experiments supported the observation that more than one fraction may be active in the cytolysis test.

Additional studies of leukocytolysis by Polysaccharide I showed that complement is essential in the reaction and that it correlated with the degree of skin reactivity to this fraction in sensitized animals. Attempts to demonstrate the participation of a "plasma factor" in leukocyte lysis by Polysaccharide I have been unsuccessful. The Polysaccharide I fraction also was shown to be cytotoxic for leukocytes and macrophages of spleens from sensitized animals in tissue culture. The activity of Polysaccharide I in tissue culture seemed to parallel its activity in the cytolysis test. The results of preliminary electrophoretic and chemical studies of Polysaccharide I suggest that it may be a glycoprotein.

It would be premature to conclude that Polysaccharide I cytolysis is different from that obtained with PPD on the basis of these studies. It seems possible that previous studies of the cytolysis phenomenon may have measured the effect of both the A protein and the Polysaccharide fractions. Even in studies which employed PPD as the antigen in the

cytolysis test, the possibility of the presence of Polysaccharide I cannot be excluded.

The role of the cytolysis phenomenon in the hypersensitive state has been the subject of considerable interest. The concept that cytolysis is not an expression of delayed hypersensitivity is supported by the observations that:

1. Immune plasma or serum may sensitize normal cells for subsequent lysis *in vitro* by tuberculin.
2. PPD cytolysis did not correlate with skin reactivity to tuberculin.
3. Polysaccharide I leukocytolysis correlated with the degree of immediate-type skin reactivity to this material.
4. Complement is essential for cytolysis by PPD and Polysaccharide I.

Certain experimental findings, however, are not compatible with this belief. The demonstration that the "plasma factor" responsible for tuberculin leukocytolysis may be an alpha globulin adds support to the view that the material is similar to the factor which is involved in the passive transfer of tuberculin hypersensitivity. In addition, the activity of the A protein fraction in the skin test and in the cytolysis reaction may be associated with tuberculin hypersensitivity since this material was shown previously to be involved in the tuberculin reaction and in the tissue culture inhibition of sensitive leukocytes. Similarly, the fact that leukocytolysis by Polysaccharide I seemed to parallel the cytotoxic effect of this material in tissue culture appears contrary to the view that cytolysis is not an expression of delayed hypersensitivity.

The results of studies on host serum chemistry suggested that the alterations in the electrophoretic distribution of serum protein and glycoprotein components which previously were reported to occur following either BCG-vaccination or tuberculous infection of guinea pigs also may occur following injection of guinea pigs with heat-killed tubercle bacilli. Experiments designed to correlate the presence of "plasma factor" with alterations in the chemical components of sera from sensitized animals following tuberculin skin testing apparently were complicated by the effect of bleeding. Sera obtained from sensitized animals after a tuberculin test showed a general decreasing parabolic trend in their content of protein, glycoprotein, and lipoprotein components which was maximal at 36 hours. Similarly, a decrease in serum protein components of normal guinea pig serum was observed at 1 and 3 days following bleeding. The values returned to normal levels within 5 to 7 days after bleeding.

When the effect of bleeding was removed, tuberculin skin testing of hypersensitive guinea pigs produced highly significant elevations in total protein, nonglucosamine (protein-bound) polysaccharide, and ester cholesterol values of serum within 3 days. The total protein increase was reflected in the electrophoretic distribution as significant elevations in the alpha-2, beta, and gamma globulin fractions. A highly significant in-

crease in alpha-1 glycoprotein and significant increases in the alpha-2 and gamma glycoprotein fractions seemed to be responsible for the marked increase in serum levels of nonglucosamine polysaccharide. A significant increase in beta lipoprotein reflected the elevation of serum cholesterol. The increase in serum polysaccharide and, perhaps, in other components may have resulted from tissue damage caused by the positive skin reactions to tuberculin. It is pertinent to mention that a highly significant increase in serum cholesterol was observed in normal guinea pigs which showed an acute inflammation following the injection of turpentine.

The effect of sensitization on the electrophoretic distribution of protein in the sera of guinea pigs also was investigated. A significant increase in total protein was observed 7 days following the injection of heat-killed tubercle bacilli. This increase persisted throughout the study and reflected highly significant elevations in the alpha-1 alpha-2, beta, and gamma globulin fractions. The albumin fraction decreased significantly during the experimental period.

A highly significant increase in levels of a lysozyme-like enzyme in the sera of guinea pigs also was observed at 10 days following the injection of heat-killed tubercle bacilli. Tuberculin skin testing of normal and sensitized guinea pigs had no detectable effect on serum levels of the enzyme 1, 2, or 3 days after the skin test. The elevation of enzyme which appeared following sensitization may persist for some time, even as long as 4 months. It is tempting to believe that elevated levels of enzyme may be a reflection of some form of *in vivo* leukocyte lysis since the increase in serum enzyme occurred at the time when *in vitro* tuberculin cytotoxicity and the cytotoxicity of tuberculin in tissue culture were demonstrable. However, it also is possible that increased enzyme levels may be a reflection of nonspecific leukocyte damage *in vivo*, which may not be related to tuberculosis or to the leukocytic reactions associated with tuberculin hypersensitivity, since a similar observation has been made in rabbits sensitized with various microorganisms and in cancer patients. It does not seem that an inflammatory response is responsible for the elevation of enzyme levels since an acute inflammation in normal guinea pigs produced by turpentine did not cause any alteration in serum levels of lysozyme-like enzyme.

MAGNESIUM DEFICIENCY IN INTACT, ADRENALECTOMIZED, AND HYPOPHYSECTOMIZED RATS

by HERBERT KORO KASHIWA*

It is well known that hormones actively participate in the body's metabolism of inorganic ions, such as parathyroid hormone on calcium and aldosterone on sodium and potassium. The relationship between the endocrine system and magnesium metabolism, however, has not been definitely established. There were, nevertheless, reports implicating hormonal activity in conserving as well as excreting magnesium. A review of reports by other investigators suggested that several hormones may control serum magnesium level, e.g., thyroxine, parathyroid hormone, ACTH, and aldosterone. It seemed highly improbable, however, that all of these hormones were involved in controlling the single cation, magnesium.

In view of the uncertainties and confusion in our knowledge of magnesium metabolism, an attempt was made in this dissertation to re-examine certain aspects of the original observations on the magnesium deficiency syndrome in intact rats and extend the studies further into the effects of adrenalectomy and hypophysectomy on the appearance, duration, and nature of the deficiency symptoms. A magnesium deficient diet containing 0.39 mg per cent magnesium was fed, *ad libitum*, for 8, 15, and 22 days to intact, adrenalectomized, and hypophysectomized rats, and the appearance and course of the magnesium deficiency symptoms recorded. Ears of the deficient rats were examined daily for hyperemia, and its severity arbitrarily scored by one to four plus indices. Weekly determinations were made on the body weights, leucocyte counts, and serum levels of magnesium, calcium, phosphorus, and cholesterol. The pituitaries, adrenals, kidneys, and hearts were weighed and examined histologically at the termination of feeding periods.

In both the intact and adrenalectomized deficient rats the growth rate, as reflected by the body weights and tibia length, was depressed compared with their controls fed *ad libitum*. In the hypophysectomized deficient rats no depression of growth, except that resulting from hypophysectomy, was observed.

When intact and adrenalectomized rats were fed, *ad libitum*, a magnesium deficient diet, their serum magnesium level decreased to the deficient level on about the 8th day. On the 15th and 22d day the serum

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magnesium level remained low in the intact rats, but a slight rise from the day 8 value was seen in the adrenalectomized deficient rats. With the decrease in the serum magnesium level, hyperemia developed gradually in the ears from the base to the apex, until both ears were entirely red and then blanched. The hyperemia, once initiated, lasted for an average of 5 days, but none of the rats were hyperemic for more than 8 days.

Since the blanching of hyperemia was not accompanied by a rise in serum magnesium level, the hyperemia was believed to have been sustained by other factors besides low serum magnesium. According to our data it would appear that a substance, yet unknown, may be responsible for this vascular reaction and that it could sustain hyperemia for only 8 days when it became inactivated or exhausted. This substance, however, could be replenished and thus reprecipitate the hyperemia, since we noticed this symptom reappeared in some rats. This observation favored the concept of earlier investigators that histamine released from mast cells was responsible for the vascular reaction. The concept of the exhaustion of histamine supply on the 8th day under chronic stimuli of low serum magnesium would now seem plausible.

During the development of hyperemia an heretofore unreported marked leucocytosis, especially eosinophilia, was observed. A value about thirty-fold above the normal level during the four plus hyperemic stage was observed in the intact rats. During the blanching of hyperemia in the intact rats, the white blood cell counts returned toward the normal value, but in the adrenalectomized rats, the counts were further elevated. The eosinophils were observed on day 15 to infiltrate tissues, especially the brown fat.

On day 8 concomitant with the decrease in serum magnesium level, appearance of hyperemia and leucocytosis, the cells lining the distal convoluted tubules and the ascending limb of Henle's loop became hypertrophied, and the nuclei of the cells became vacuolated but retained their normal nucleoli. Especially at the cortico-medullary junction the cells of the ascending limb of Henle's loop usually degenerated by first transforming into cells with pyknotic nuclei and eosinophilic cytoplasm and then accumulating calcareous deposits. The affected cells of the distal convoluted tubules were observed to be less prone to degeneration by pyknosis and accumulation of calcium deposits. The cells appeared to regenerate by transforming into a squamous type epithelium. These kidney lesions were similar to those described for potassium deficient rats but were probably caused in our rats by magnesium deficiency per se since the diet contained an adequate source of potassium.

With the decrease in the serum magnesium level in the intact rats, the serum calcium level was increased, and the serum phosphorus decreased. In the adrenalectomized rats the decrease in serum magnesium level was not accompanied by changes in either the calcium or phosphorus levels.

The serum cholesterol level showed no consistent pattern of fluctuation in the intact or adrenalectomized deficient rats.

When hypophysectomized rats were fed a magnesium deficient diet, the serum magnesium was not depleted on the 8th day, as it was in the intact and adrenalectomized rats. On this day the serum magnesium level retained the prediet value but was gradually depleted until it reached a deficient level on the 22d day. With the depletion of serum magnesium level on day 22, hyperemia, leucocytosis, and kidney lesions, which appeared on day 8 in the intact and adrenalectomized rats, made their first appearance in the hypophysectomized rats. The kidney lesions developed on day 22 in the hypophysectomized deficient rats were predominantly that of hypertrophied cells with vesiculated nuclei lining the distal convoluted tubules and the ascending limb of Henle's loop, especially within the medullary rays. Distal convoluted tubules with flattened epithelium were also seen, but occasionally other tubules with pyknotic nuclei and calcium deposits were present. The kidneys of hypophysectomized rats on days 8 and 15, however, appeared normal.

With the depletion of serum magnesium level in the hypophysectomized rats, the serum calcium level remained unchanged, but the phosphorus level was decreased. This decrease in serum phosphorus however was not a response to magnesium deficiency but was due to hypophysectomy, since the hypophysectomized control rats also had a low phosphorus level. The serum cholesterol level in the hypophysectomized rats was elevated, but this again was a reflection of hypophysectomy rather than magnesium deficiency.

The delay in the depletion of serum magnesium level up to the 22d day in the hypophysectomized deficient rats implied the possibility of pituitary involvement in magnesium control. Histological examination of the pituitary and adrenal glands in the intact and adrenalectomized deficient rats did not reveal any consistent or marked alterations, as reported by others, during acute or chronic activity of these glands. The zona glomerulosa, known to increase in width and be depleted of its lipid content in sodium deficient rats and decreased in width with retention of lipids in potassium deficient rats, was not altered significantly in our magnesium deficient animals.

The normal appearance of the kidneys during days 8 and 15 seemed to be related to the retention of normal serum magnesium level. Previous investigators have shown that magnesium was efficiently conserved during the consumption of a diet low in this cation and was actively reabsorbed at the distal portion of the nephron. We believe that the specificity of the lesion in the distal convoluted tubules and the ascending limb of Henle's loop in the magnesium deficient rats indicated a probable causal relationship between the physiologic overactivity of the distal tubules in reabsorbing magnesium and the appearance of the lesions.

Myocardial degeneration with frequent calcium deposits and occasional thickening of endocardium were observed in the intact and adrenalectomized rats fed the deficient diet for 22 days. The calcium deposits occurred in the superior one-third of the left ventricle. The aorta and other blood vessels were not calcified. No lesions were found in the heart of intact and adrenalectomized deficient rats on days 8 and 15 nor in hypophysectomized deficient rats during the entire feeding period. Unlike the kidney pathology the heart lesions did not appear coincident with the initial decrease in serum magnesium level. The heart lesions were believed to be caused by a chronic period of depletion of serum magnesium.

A previously unreported metaplastic cartilage formation at the junction of the aorta with the semilunar valve was observed in the magnesium deficient rats. However, a definite causal relationship between low serum magnesium level and the cartilage formation could not be established by the data in this experiment.

Data from our experiments demonstrated the reproducibility of magnesium deficiency symptoms in the adrenalectomized and hypophysectomized rats. It has been further shown that the appearance of deficiency symptoms, as well as the decrease in serum magnesium level, were definitely delayed in hypophysectomized rats. This delay indicated a definite positive relationship between the pituitary and magnesium metabolism.

A STUDY OF THE SELF CONCEPTS OF A GROUP OF WOMEN PATIENTS WHO, THOUGH CLINICALLY IN REMISSION, REMAIN IN A MENTAL HOSPITAL

by MINNIE ROB PHAUP*

The problem of clinically improved mental patients who find it difficult to leave the hospital is a significant one from both the human and the economic standpoints. In a study of the self concepts of twenty-five women patients at St. Elizabeths Hospital in Washington, D. C., who though clinically in remission find it difficult to leave the hospital, the experimental group was selected from a larger group of one hundred twenty-two women patients suggested by staff personnel who know them as belonging to the category of clinically improved but failing to profit from efforts made to help them leave the hospital.

The twenty-five patients selected for the study were chosen with the idea of employability in mind. They were all under fifty-five years of age, physically fit, and possessed of at least a high school education. Most of them had had some specialized training beyond high school, some had college degrees, one had a Master's degree and one a Bachelor's degree plus an R. N. Illnesses represented cut across diagnostic categories—nineteen of the group having been diagnosed as suffering one of the schizophrenias, one as manic-depressive, one as passive-aggressive personality—alcoholic factors, and four as psychoneurotic. Twenty-five women comparable in age, education, and marital status but drawn from the community served as the control group.

The two hypotheses set up at the beginning of the study were

1. That patients who, though clinically in remission, remain in the hospital not profiting from rehabilitation opportunities have certain common characteristic patterns of reaction which can be identified.
2. There is likely to be a greater discrepancy between the patients' assessments of themselves and their ideas of what they should be than will be shown by women of the same age, marital status, and educational background making a satisfactory community adjustment.

Because Q methodology and technique as delineated by William Stephenson seems to us a peculiarly appropriate means of investigating the self-concepts, actual and ideal, of our groups, we decided to set up a structured Q sort in accordance with Fisherian analysis of variance design. To this end considered reading of patients' test records, case histories, and correspondence was undertaken; consultations were held with clinical psychologists and a psychiatrist on the hospital staff, and the design for the structuring of statements for the Q sort was decided upon.

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The scheme, based on Horney's classification of individuals as moving toward, against, or away from the environment, follows:

INDEPENDENCIES		LEVELS		
I. Individual	A. Mental		B. Physical	
II. Environment	C. Toward	D. Against	E. Away	

Remarks of patients, statements about the patients made by psychiatrists, ward personnel, members of their families, and friends as well as suggestions from the M. M. P. I., the Bell Adjustment Inventory, and the Cornell Selectee Index were adapted as items for the Q sort.

Eighty-four items—fourteen in each of six categories, "mental towards", "mental against", "mental away", and "physical towards", "physical against", and "physical away", composed the Q sample used. These were sorted twice by both the patients and the controls, the first time according to how they saw themselves to be and the second time as to how they felt they should be. The sort was a forced choice distribution into eleven piles from 0—least like me—to 10—most like me—for the self sort and from 0—least like the person I should be—to 10—most like the person I should be—for the ideal-self sort. The sorting approximated a normal distribution.

An analysis of variance done on each of the sorts made by members of both experimental and control groups indicated that the variance in the statements from category to category is significantly greater than the within-category variance.

As regards our hypothesis that there is likely to be a greater discrepancy between the self concepts and the ideal-self concepts of the patients than of the controls, chi-square tests on the ends of the distributions for each group showed that the hypothesis was supported statistically. The ends of the distribution, the 8, 9, 10 scores and the 0, 1, 2 scores, were used since these are the ones that give a picture of the subjects. The middle of the distribution—4, 5, 6 scores—is reserved for those statements designated as neutral, i.e., not applying to the sorter or unimportant to him.

It is interesting that a comparison of the patients' ideal-self sorts with the ideal-self sorts of the community group showed no significant difference.

Chi-square tests done on the differences in use of the six categories by the experimental and the control groups showed statistically significant differences when the high and the low ends of the distributions were considered, except for the 0, 1, 2 end of the BC—"physically toward", BD—"physically against", and BE—"physically away" categories.

Because the focus of the research is basically the self-concepts of the hospital group, a factor analysis of the patients' self-sorts was undertaken. In accordance with Stephenson's recommendation for data derived from a structured Q sort procedure, Thurstone's centroid method of factor analysis was used; and three factors, I, II, and III, were

derived. Our next task was to rotate the axes to maximize the obvious tendency of some patients to cluster on each factor and thus permit operational definition of the factors. This was done by the method of extended vectors and resulted in factors I', II', III'. Though most of the patients have some loading in each of the three factors, patients 2, 4, 5, 19, and 20 have relatively high loadings in factor I'; patients 1, 6, 10, 12, 13, 22, and 23 have almost pure loadings on factor II'; and 2, 3, 11, 14 exhibit comparatively heavy loadings in factor III'. Factor I' as defined by the statements chosen as important for them by the patients who cluster on that factor seems to be mainly a denying of the use of "against" and "away" mechanisms. Factor II' seems to resemble factor I' except that in it there is more emphasis on affirmation of the "moving toward" mechanism, and factor III' seems to be defined by the "moving away" pattern. Our fairly homogeneous group of patients, then, would seem to be homogeneous in that all three factors are used by all of them, but there is real indication of subgroups, two of which are similar and the third showing enough difference to determine "operationally" a factor almost orthogonal to the first.

Because of the nature of the hospital in which the study was done, our experimental group was neither a provincial one nor one to which only limited therapeutic help has been available. Therefore, since the original group from which the twenty-five patients studied were drawn numbered only one hundred twenty individuals from a hospital population of more than three thousand women inmates, we feel justified in concluding that at least the quantitative enormity of the problem of improved women patients who tend to remain in a mental hospital has been exaggerated.

Also the often-made assertion among clinicians that mental patients frequently exhibit greater disparity between what they see themselves to be and what they feel they should be than "well" individuals show has been borne out statistically.

That the behavior mechanisms—"moving toward", "moving against", and "moving away" on both the physical and the mental levels are for the most part differentiating between the experimental group and the control group was supported statistically.

A factor analysis of patients' self-sorts permitted extraction of three factors; when these were rotated to maximize clustering, three subgroups emerged. However, since most of the twenty-five patients have some loading on all three factors, emotional conflicts may be inferred.

Finally results of the factor analysis as well as those derived from statistical treatment of differentiations among the categories lend support to our hypothesis that patients who, though clinically in remission, remain in the hospital not profiting from rehabilitation opportunities have certain common characteristic patterns of reaction which can be identified. At least we feel that this is true for our group.

MULTIVARIATE EXPERIMENTAL DESIGNS

by HARRY MYER ROSENBLATT*

This investigation enters into the relatively new but broad field of multivariate experimental design and analysis, and thus deals with the statistical analysis of experiments involving multiple response random variables which are jointly dependent. The scope of the subject treated is limited to random variables which follow a k -variate normal distribution with common covariance matrix $\underline{\Sigma}$, and to experiments of known, or fixed, effects. The underlying theory developed for the analysis of multivariate experiments is based jointly on statistical information theory [Kullback and Liebler (1951), Kullback (1959)] and on the theory of multivariate linear regression. A result is the presentation of a very general methodology which is applied in a uniform manner to arrive at the appropriate statistical test for many hypotheses pertinent to the multivariate experimental designs considered. The method can be applied, in the same uniform manner, to multivariate experiments which are not specifically treated. A procedure of defining the unique multivariate linear regression model $Z = \underline{Y} - \underline{X}\alpha \underline{B}\alpha$ specified by the alternative and the null hypotheses \bar{H}_a , $a = 1, 2$, respectively, facilitates the mathematical analysis. The test statistic

$$\hat{J}(1,2) = \text{tr } \hat{\underline{\Sigma}}^{-1} (\hat{\underline{B}}^1 - \hat{\underline{B}}^2)' \underline{X}' \underline{X} (\hat{\underline{B}}^1 - \hat{\underline{B}}^2)$$

is twice the minimum discrimination information statistic $\hat{I}(1:2)$. The distribution theory is based on two results. One is that asymptotically,

$$\hat{J}(1,2) = X^2_{(qk)},$$

the chi-square distribution with qk degrees of freedom, where q is the difference between the number of constraints under the alternative and the null hypothesis [Kullback (1956), (1959), Anderson (1958), and others]. The other result is Lawley's approximation [Lawley (1938)], namely

$$\hat{J}(1,2) = \frac{qk(n-p)}{n-p-k+1} F_{(n_1, n_2)}$$

where, F has the analysis of variance distribution under the null hypothesis H_2 with adjusted degrees of freedom

$$n_1 = [qk(1+c)] \quad n_2 = [(n-p-k+1)(1+c)]$$

and

$$c = (q-1)(k-1)/(n-p)$$

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with n_1 and n_2 taken as the nearest integer in the square brackets; n is the number of observations, p is the number of constraints under the alternative hypothesis H_1 , and q is defined as above.

The argument is made in Chapter I that there is an increasing need for multivariate methods of statistical analysis, and that this has come about for two principle reasons. One is the increasing recognition of the fact that random fluctuations of natural phenomena are best understood through the study of joint random variables; the other, results from the more recent availability of sophisticated computing machines to perform the required arduous arithmetic of multivariate methods thus making these methods more attractive, although not lessening their necessity in many situations. Wishart's view on the difficulties of the subject and the need for its development [Wishart (1955)], Rao's comment on the dearth of multivariate methods for analyzing experiments [Rao (1952), p. 236], the contribution of this dissertation, and related work are also discussed in this chapter.

Assumptions of the study are presented, and the theory of multivariate linear regression is developed in some detail in Chapter II. For example, one readily sees that the estimates of the regression parameters in the k -variate case are identically those obtained if the parameters were estimated separately for each of k univariate regressions. The information parameters $I(1:2)$ and $J(1,2)$ are derived, the information statistics and their distribution are presented, and the use of the information statistic $\hat{J}(1,2) = 2\hat{I}(1,2)$ for testing the appropriateness of any multivariate linear regression model is discussed. The theory presented here serves as a general foundation for the multivariate methods later developed to test statistical hypotheses of multivariate regression models and of models of multivariate experimental design.

The analysis of single category multivariate regression models is presented in Chapter III. This includes testing various subhypotheses which require a two-way partitioning of known factors or of stochastic variates, or a 2×2 partitioning of both factors and variates. Three-way and four-way partitioning of a multivariate regression model is also presented. Chapter IV details the analysis of multiple category multivariate regression models. Statistical hypotheses of homogeneity of regression, various subhypotheses of partial homogeneity, and special cases of interest dealing with hypotheses on means only, are considered and the appropriate tests are given. Estimates of the regression parameters are derived for the various models considered in Chapters III and IV. The estimate of the covariance matrix under the alternative hypotheses is also presented. The pooled estimate of the covariance matrix for m samples arises quite naturally in an expression completely analogous to the pooled estimate of the variance in the univariate case. Partitioning of stochastic variates to test an hypothesis with one specification for

$k_2 < k$ of the variates, and another specification for the remaining $k - k_2$ variates, introduces an entirely new type of statistical hypothesis for which further research is required. For the present, asymptotic theory for the distribution of the information test statistic $\hat{J}(1,2)$ is employed to test such an hypothesis.

The specific analysis of multivariate experimental designs is presented in detail in Chapter V. The designs considered are the one-way classification, the two-way classification, the latin square, the two-way classification with regression, and the latin square with regression. In the last two multivariate designs, the terminology "with regression" refers to designs with "multiple covariance" as the expression is used in describing univariate designs. In developing the analysis, restrictions on the parameters in each design are entered directly into the development of the experimental model representing the design. This procedure is equivalent, mathematically, to that of reparametrization used by most authors in introducing a transformation on matrices not of full rank when singular matrices would develop. It appears to have the advantage in avoiding nonsingular matrices, thus precluding the need for the transformation, and to make the analysis direct and simpler, mathematically, to develop. A notation is employed which illustrated that the analysis of multivariate experiments is quite analogous to the analysis of univariate experiments, except that individual observations are replaced by vector observations. The analysis and the test statistic arises naturally through the approach of multivariate regression and statistical information theory developed in the previous chapters. The analyses are summarized in a "multivariate analysis table" which may be considered a multivariate generalization of the univariate analysis of variance. Applications illustrating the theory are presented. In a two variate experiment, an application of the Kullback minimum discrimination information statistic rejected the null hypothesis with a higher probability than did the Wilks' likelihood ratio criterion in those cases where the null hypothesis was rejected by univariate tests for one or both variates.

The presentation of the material in this dissertation has been directed to the experienced practicing statistician and to the beginning graduate student with the intent that the new analytical methods offered be applied in practice and that the generality of the development be recognized and used to explore the analysis of other multivariate experiments of their own interest. For pedagogical reasons, a notation has been employed throughout which illustrates, in many instances, the correspondence between univariate and multivariate methods of analysis. This investigation is considered a first exploration, and upon completion of this dissertation, it is planned to pursue the subject of multivariate experimental designs further as a research program.

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The argument is made in Chapter I that there is an increasing need for multivariate methods of statistical analysis, and that this has come about for two principle reasons. One is the increasing recognition of the fact that random fluctuations of natural phenomena are best understood through the study of joint random variables; the other, results from the more recent availability of sophisticated computing machines to perform the required arduous arithmetic of multivariate methods thus making these methods more attractive, although not lessening their necessity in many situations. Wishart's view on the difficulties of the subject and the need for its development [Wishart (1955)], Rao's comment on the dearth of multivariate methods for analyzing experiments [Rao (1952), p. 236], the contribution of this dissertation, and related work are also discussed in this chapter.

Assumptions of the study are presented, and the theory of multivariate linear regression is developed in some detail in Chapter II. For example, one readily sees that the estimates of the regression parameters in the k -variate case are identically those obtained if the parameters were estimated separately for each of k univariate regressions. The information parameters $I(1:2)$ and $J(1,2)$ are derived, the information statistics and their distribution are presented, and the use of the information statistic $\hat{J}(1,2) = 2\hat{I}(1,2)$ for testing the appropriateness of any multivariate linear regression model is discussed. The theory presented here serves as a general foundation for the multivariate methods later developed to test statistical hypotheses of multivariate regression models and of models of multivariate experimental design.

The analysis of single category multivariate regression models is presented in Chapter III. This includes testing various subhypotheses which require a two-way partitioning of known factors or of stochastic variates, or a 2×2 partitioning of both factors and variates. Three-way and four-way partitioning of a multivariate regression model is also presented. Chapter IV details the analysis of multiple category multivariate regression models. Statistical hypotheses of homogeneity of regression, various subhypotheses of partial homogeneity, and special cases of interest dealing with hypotheses on means only, are considered and the appropriate tests are given. Estimates of the regression parameters are derived for the various models considered in Chapters III and IV. The estimate of the covariance matrix under the alternative hypotheses is also presented. The pooled estimate of the covariance matrix for m samples arises quite naturally in an expression completely analogous to the pooled estimate of the variance in the univariate case. Partitioning of stochastic variates to test an hypothesis with one specification for

$k_2 < k$ of the variates, and another specification for the remaining $k - k_2$ variates, introduces an entirely new type of statistical hypothesis for which further research is required. For the present, asymptotic theory for the distribution of the information test statistic $\hat{J}(1,2)$ is employed to test such an hypothesis.

The specific analysis of multivariate experimental designs is presented in detail in Chapter V. The designs considered are the one-way classification, the two-way classification, the latin square, the two-way classification with regression, and the latin square with regression. In the last two multivariate designs, the terminology "with regression" refers to designs with "multiple covariance" as the expression is used in describing univariate designs. In developing the analysis, restrictions on the parameters in each design are entered directly into the development of the experimental model representing the design. This procedure is equivalent, mathematically, to that of reparametrization used by most authors in introducing a transformation on matrices not of full rank when singular matrices would develop. It appears to have the advantage in avoiding nonsingular matrices, thus precluding the need for the transformation, and to make the analysis direct and simpler, mathematically, to develop. A notation is employed which illustrated that the analysis of multivariate experiments is quite analagous to the analysis of univariate experiments, except that individual observations are replaced by vector observations. The analysis and the test statistic arises naturally through the approach of multivariate regression and statistical information theory developed in the previous chapters. The analyses are summarized in a "multivariate analysis table" which may be considered a multivariate generalization of the univariate analysis of variance. Applications illustrating the theory are presented. In a two variate experiment, an application of the Kullback minimum discrimination information statistic rejected the null hypothesis with a higher probability than did the Wilks' likelihood ratio criterion in those cases where the null hypothesis was rejected by univariate tests for one or both variates.

The presentation of the material in this dissertation has been directed to the experienced practicing statistician and to the beginning graduate student with the intent that the new analytical methods offered be applied in practice and that the generality of the development be recognized and used to explore the analysis of other multivariate experiments of their own interest. For pedagogical reasons, a notation has been employed throughout which illustrates, in many instances, the correspondence between univariate and multivariate methods of analysis. This investigation is considered a first exploration, and upon completion of this dissertation, it is planned to pursue the subject of multivariate experimental designs further as a research program.

RELATION BETWEEN CONSISTENCY AND EGO-SUPPORTIVENESS OF INFLUENCE TECHNIQUES USED BY PARENTS AND BEHAVIOR AND SELF-ACCEPTANCE OF CHILDREN

by FREDDIE ORLEANS SABGHIR*

INTRODUCTION

The way in which the socialization process takes place within the family can be described along a number of dimensions. Two dimensions singled out for study here are: (1) the content of various kinds of parental behavior; and (2) the variability of the behavior.

ANTECEDENT VARIABLES

The Content of Parental Behavior

This is an attempt to view the parental behavior in the light of the necessary prerequisites of personality development in the child. The term ego-supportive is used here to indicate reference to the content dimension of parental behavior and its relevance to the child and to indicate various types of parental behavior assumed to be similarly related to the child's behavior.

Variability of Parental Behavior

The term consistency is used here to refer to the variability dimension of parental behavior. By consistency is meant the similarity of occurrence of any parent behavior variables as exhibited over time or between two or more socializing agents—in this case similarity of mother's and father's behavior.

CONSEQUENT VARIABLES

Child's Compliance to Parents

The child's response to the parents is studied to determine the relative effectiveness of various kinds of consistency and ego-supportive behavior. The general question here is: do the antecedent dimensions singled out for investigation here, in fact, affect the extent of the child's compliance to the parent?

We face such specific questions as, for example: is the child apt to be

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more compliant the more consistent, or the more ego-supportive, the parent? Will the child be better able to discriminate the appropriate cues in his interaction with the parent if the parent is more consistent? If the parent is more ego-supportive? When the parent uses different techniques?

Child's Self-perception and Perception of Parents

The child's recognition of himself as a behaving, feeling entity, and as possessing certain traits, is necessary if he is to function as a social creature in response to other social objects. The self is a reflection of others' evaluation. Hence, persons exposed to different socialization experiences would have different self-concepts. Because one's self-concept is so intimately related to others' evaluation of the self, it can further be assumed that the self's perception of these significant others is related to their evaluation and behavior toward him. Fantasy-provoking stimuli—miniature dolls and doll play material—were used to explore the relationship between parental behavior and child's perception of himself and his parents.

Overt Behavior

The child's overt behavior is studied to determine whether differences in the consistency and content of parental behavior affect the way the child learns to interact with other persons. Interaction with others would also reveal heightened needs which have been accentuated by different socialization experiences. To the extent that such heightened needs result in behavioral manifestations of which the individual becomes aware—either as a result of his being aware of the significance of his own gestures or because others have called his behavior to his attention—it can further be assumed that the presence of increased needs would, along with others' evaluation of the self, contribute to one's self-concept.

HYPOTHESES

1. Relevant to Child's Response to the Parent

The more consistent the parent:

- a) the more consistent the child's response
- b) the more compliant the child
- c) the more discriminative the child's response

The more ego-supportive the parent:

- a) the more compliant the child
- b) the more discriminative the child's response
- c) the greater the number of interactions between parent and child prior to the resolution of the divergence

2. Relevant to Fantasy Behavior

The more consistent the parent:

- a) the more aware and accepting the child will be of parental roles and of the parents
- b) the more self-accepting the child

The more ego-supportive the parent:

- a) the more aware and accepting the child will be of parental roles and parents
- b) the more self-accepting the child

3. Relevant to Overt Behavior

The more consistent the parent:

- a) the more self-accepting behavior the child will exhibit
- b) the more moderate the power-assertive behavior of the child

The more ego-supportive the parent:

- a) the more self-accepting behavior the child will exhibit
- b) the more moderate the power-assertive behavior of the child.

METHOD

SAMPLE

There are two groups of subjects. One group consists of twelve children from white middle class families. The parents of these children were mostly native born and Protestant. All had attended college. The fathers were professionals, executives, salesmen, etc. The other group consists of ten children from white working class families. The parents of the group were mostly of East European descent and Roman Catholic. None of these parents went beyond high school. The fathers were predominantly in "blue collar" and skilled trades' occupations.

PROCEDURE

The Parent Interview

The information concerning the parents' behavior was obtained by the Merrill-Palmer staff through the use of interviews with the parents in which the parent recapitulated the interaction which had taken place between the child and himself the previous day.*

Observation of Child Behavior in the Nursery School

The information concerning the child's behavior was obtained by the Merrill-Palmer staff through narrative recording of the child's total

* Described by Dr. M. L. Hoffman, "An Interview Method for Obtaining Descriptions of Parent-Child Interaction," *Merrill-Palmer Quart.*, Vol. III (1957), 2: 76-83.

behavior in the nursery school setting: as full a description account as possible of what the child was doing before the teacher intervened, exactly what the teacher did and said, and the child's subsequent responses to these techniques. In addition, the child's interaction with other children and adults was observed. Each child was observed, using the Wolf method for transcription, for three 30-minute periods, making a total of 90 minutes of detailed observation. The situations sampled were free play, juice, and nap.

Doll Play Procedure

At the time when the experimenter obtained the fantasy data, there were ten children available, four in the middle class nursery school and six in the working class nursery school. Of these ten children, eight participated in one doll-play session lasting from 20 to 30 minutes, and two participated in three brief doll-play sessions in which they spent a minimum of 20 minutes in total time.

All children were subjected to the same conditions during the doll-play sessions in that they were presented with the same materials, presented in the same manner, and subject to the same type of response by the experimenter.

MEASURES OF CONSISTENCY

Mother's Consistency Measures and Father's Consistency Measures

Use of power assertion: (1) *over-all power*—the extent to which some form of power assertion is used, with or without any other types of nonpower-assertive techniques, minus the mean for the group; (2) *power alone*—the extent to which power-assertive techniques are used alone, minus the mean for the group; (3) *pressure*—the extent to which techniques used in reactive interactions were of high and/or increasing power assertion, minus the mean for the group.

Persistence: (1) *initial compliance*—the percentage of total behavior sequences in which the child complied following the parent's initial influence attempt; (2) *final compliance*—the percentage of total behavior sequences in which the child fully complied; (3) *persistence*—the percentage of behavior sequences in which the child initially did not comply, which were multiple interaction sequences.

Situational consistency: (1) *initial situation*—difference between routine and nonroutine situation in the extent to which over-all power assertion was used in initial interactions and (2) *reactive situation*—difference between routine and nonroutine situation in the extent to which pressure was high or increased in reactive interactions.

Characteristics of technique determinants: (1) *reasons*—the extent to which the parent had non-child-oriented reasons for the techniques used, minus the mean for the group and (2) *feelings*—the extent to which the

parent expresses negative feelings toward the child, minus the mean for the group.

Family Consistency Measures (Parental Similarity Measures)

Measures of similarity between the parents were developed in the same way for each of the above ten types of consistency. In each case the extent of the difference between the mother's and father's behavior was computed by subtracting the score representing the mother's total amount of behavior (i.e., extent of use of over-all power, unqualified power, pressure, etc.) from the father's total score. Since it is the amount of difference in which we are interested and not the extent to which the mother behaves in a particular way more than the father (or the father more than the mother) the signs were ignored and the absolute amount of the difference used.

MEASURES OF EGO-SUPPORTIVENESS

There are five general types of ego-supportive measures used. Three have to do with the use of power and two have to do with technique determinants. The more power assertive the parent, the less ego-supportive he is assumed to be.

1. *Over-all power*.—The extent to which the parent uses power assertion with or without using any other type of technique
2. *Power alone*.—The extent to which the parent uses power assertion without using any other type of technique, i.e., reasons, permitting closure, etc.
3. *Pressure*.—The extent to which the parent reduces pressure in reactive interactions, or uses the same low-power techniques used in the initial interaction
4. *Reasons*.—The extent to which the parent is less apt to use compliance-oriented reasons
5. *Feelings*.—The extent to which the parent expresses less-negative feelings toward the child

There are eight types of specific ego-supportive measures. Four have to do with cause-and-effect aspects of the situation, and four have to do with the child's needs:

1. Cause-and-effect explanations relevant to the child's own welfare
2. Cause-and-effect explanations relevant to other people
3. Explanations related to cognitive aspects of the situation
4. Cause-and-effect explanations other than Types 1 and 2 above
5. Closure-permitting techniques
6. Techniques which make the situation more pleasant or indicate warmth toward the child
7. Negative moral evaluation
8. Positive evaluation

DISCUSSION OF RESULTS

RELATIONSHIP BETWEEN PARENTAL CONSISTENCY AND EGO-SUPPORTIVENESS AND CHILD'S COMPLIANCE TO PARENTS

Measures of Compliance

Two measures of compliance were used: (1) *initial compliance*—the percentage of time the child complied following the parent's first influence attempt and (2) *final compliance*—the percentage of interaction sequences which ended in compliance by the child.

In addition, each measure was viewed in terms of: (1) the consistency with which the child complied—those children who were most apt or least apt to comply; (2) the extent of the child's compliance, as described above; and (3) differential compliance—the extent to which the child is more compliant to the mother than to the father, i.e., using compliance to mother as the criterion scores.

Summary of Results

Middle class children are more consistent, the more consistent the parents, especially the more consistent the mother in her use of power alone. Working class children—boys and girls—are more compliant the more ego-supportive, the less power assertive, the parents. This difference is accounted for by the assumption that, apparently, a minimum amount of power assertion is needed (the middle class parents exhibited the least), but beyond that minimum children were apt to be more compliant the less power-assertive the parent.

Although children of ego-supportive parents are somewhat more compliant than children of less ego-supportive parents, when differentiating between their own parents, children of all groups are—in initial interactions especially—more compliant to the more power-assertive of the two parents. For working class children, the child was also more apt to comply more quickly to less power-assertive parents, but more quickly to the more power-assertive of the two parents. It is the amount of difference between the parents, as well as the amount of power assertiveness to which the child is exposed, that accounts for his differential compliance to the more power-assertive parent since the greater the difference between the parents, the more the child complies to the more power-assertive parent.

Another important difference is in the child's response in initial and reactive interactions. In *initial* interactions, before the "battle lines" are drawn, the child will be more compliant to the more power-assertive parent; and in a moderately power-assertive group—i.e., the middle class group here—the child will be more compliant to the more power-assertive techniques and not necessarily more apt to comply to more or less power-

assertive parents. In *reactive* interactions, apparently, the particular immediate situation assumes more importance so that the child's behavior is less determined by the expectations established in the past.

The suggested explanation for the child's compliance to the more power-assertive of his two parents is either fear or loss of love or fear of threat of further power assertion. In addition, this finding is considered an explanation of the layman's perception that the more power-assertive one is, the more compliant the child, since parents only observe what occurs in their own homes but have no basis for comparison with other parents.

RELATIONSHIP BETWEEN PARENTAL CONSISTENCY AND EGO-SUPPORTIVENESS AND CHILD'S USE OF FANTASY MATERIAL

Measures Developed from Fantasy Behavior

1. Measures considered to be indicative of acceptance of parents: (a) the extent to which the doll representing the parent is used and (b) the differential use of dolls—the greater use of one parent doll than the other parent doll.

2. Measures of awareness of parents and parents' roles.—A level of activity dimension was explored on the assumption that there are different levels of personal and inter-personal behavior, and that the portrayal of these will be related to the child's comprehension of them; that parental influence techniques will be related to the depth of inter-personal relationship that the child experiences; and that the child's use of fantasy will reflect his awareness of the relationship. Five categories into which the fantasied behavior falls are perceived as points on a continuum, and are as follows:

- a) Exploration by the child of the doll play material
- b) Manipulation of the material involving non-thematic use of material
- c) Self-care in routine activities necessary for the minimum self-care in which members of the family habitually engage
- d) Role behavior
- e) Interpersonal behavior, defined as behavior in which two or more dolls are involved and the focus of the activity is another doll.

3. Measures of self-acceptance.—Measures of different types of involvement in the play activity were developed on the assumption that the more self-accepting the child, the more readily he will become involved with the play material, the greater use he will make of all the material and of the dolls in particular. The six indices of involvement are:

- a) Total behavior units
- b) Inappropriate use of dolls or equipment
- c) Use of self doll
- d) Total thematic material
- e) Total use of dolls
- f) Negative verbalization.

Summary of Results

It was found that the more similar the parents are to each other, the more ego-supportive the parents are in their use of power assertion and in their reasons and feelings, and the more they use emotionally oriented ego-supportive techniques: (1) the more involved the child becomes in his use of the doll play material; (2) the more he used moderately high level of activity; (3) the more he uses the doll representing the less power-assertive parent; (4) the more he uses the doll representing the less power-assertive of his two parents.

Likewise, the more parents use cognitively ego-supportive techniques and the more consistent each parent is when considered separately (intraparental consistency), the less involved the child becomes with the material.

Three measures of involvement used (inappropriate use of material, use of self doll, and total behavior units) are highly related to parental behavior. However, the relationship is, for two of them, in the direction opposite to that predicted. Thus, the more ego-supportive the parent, the less use the child makes of the self doll and the more inappropriate the behavior in which he engages. The explanation offered here is that the children who exhibit more inappropriate play are those who feel freer in their use of the material and become generally more involved in their use of the material. This is partially substantiated by an inter-correlation analysis of the six measures of involvement. Inappropriate behavior is positively related to the child's use of the material and to negative verbalization. It is negatively related to the child's use of the self doll but unrelated to the other measures of involvement. Thus, it is those children who become involved in the use of the dolls to the extent that they spend a greater amount of time with them, who are able to feel sufficiently at ease with the material to use dolls other than the self doll, and to use the material freely and unconventionally.

The other finding contrary to our prediction was that the more ego-supportive the parent, the less use the child made of the self doll. This would seem to imply that the more ego-supportive the parent, the less need the child has to use the self doll to act out a fantasy situation, and the more interested he is in exploring or acting out other behaviors. It is also possible that such children have developed to the point where they are looking beyond themselves, and are more interested in possible identification with their parents and in exploring parental behavior.

The analysis also indicates that the various types of ego-supportive non-power technique categories tend to be related to fantasy behavior differently: that the four categories of cognitive ego-supportive techniques—that is, child welfare, concern for others, cause-and-effect, and reality-oriented techniques—are related to a lower level of activity portrayed

with the dolls, more negatively related to measures of involvement; negatively related to the use of the mother doll; and unrelated to the use of the father doll. On the other hand, the other types of ego-supportive techniques—i.e., closure, valencizing, negative moral evaluation, and positive evaluation—are related in the opposite direction, by and large, to these doll measures. It may be that the use of reality and situation-oriented techniques involves a different level of interaction than the other categories, which appear to be somewhat more related to the child's need system by offering warmth, closure, and evaluation rather than merely a cognitive description—even where that description of a situation is in terms of the consequences for the child. It may be that certain kinds of techniques—i.e., closure-permitting and affection-giving techniques—are a necessary prerequisite to allowing perception-defining techniques to be useful.

RELATIONSHIP BETWEEN PARENTAL CONSISTENCY AND EGO-SUPPORTIVENESS AND CHILD'S OVERT BEHAVIOR IN THE NURSERY SCHOOL

Measures of Overt Behavior

The assumption is made here that: (1) the less hostile; (2) the more restrained the child's expression of negative feelings; (3) the less restrained his expression of positive feelings; (4) the less power assertive; (5) the more moderate the child's power assertion; (6) the more compliant; and (7) the more emotionally secure the child (i.e., the teacher's rating of his behavior)—the more accepting of others and the more self-accepting the child. Four kinds of overt behavior are examined here: the child's expression of his feelings, compliance to others, assertiveness, and emotional security rating.

Summary of Results

The relationship between consistent behavior by the parents and child's overt behavior is such that intraparental consistency, in general, results in the same kind of behavior as does parental power assertion; while interparental similarity results, in general, in the same kind of behavior as does parental ego-supportiveness, i.e., the child is less hostile, less power assertive, more emotionally secure, and more compliant, the more similar the parents are to each other and the less consistent, the more ego-supportive, either parent is.

Attention needs to be paid to effects of intraparental consistency. Two possible explanations suggest themselves. First, it may be that the most ego-supportive and the least ego-supportive parents have the same effect on overt behavior for different reasons. Thus, heightened hostility, tension-autonomy needs, and power-assertive needs may result from the less

ego-supportive behavior and find expression because they have become exaggerated. Similar behavior may result from more ego-supportive behavior by parents, not because the needs are greater but because what needs do exist, are more readily permitted expression. Children of moderately ego-supportive parents may not have the heightened needs and, in addition, they may not be permitted the ready expression of the needs that do exist.

Another possible explanation might be that, regardless of the ego-supportiveness of parental behavior, the more consistent the parent, the better established the child's expectations and the less freedom of movement he perceives. Thus, knowing pretty well ahead of time how the parent will behave may result in a feeling of being limited, of being less able to have any effect on the situation, and therefore increase the child's feeling of frustration.

The first explanation suggested is in terms of how ego-supportive the parent is; while the second is in terms of the consistency of the behavior.

CHOLESTEROL UPTAKE BY INVERTED INTESTINAL SACS

by ARCHIE LEE SMITH*

While many studies have demonstrated that most animal tissues possess the ability to synthesize cholesterol, it has also been shown that dietary cholesterol can supply a large part of the body sterol. Intensive *in vivo* investigations in recent years have demonstrated the importance of both dietary and endogenous factors for intestinal absorption of dietary cholesterol. Dietary fatty acids have been shown to facilitate the absorption of cholesterol. Bile salts, which are essential for sterol absorption, were thought to aid in the esterification of cholesterol prior to entrance of the sterol into intestinal lymph. It has been suggested that the esterification is catalyzed in the mucosa by the enzyme cholesterol esterase. The importance of these factors in cholesterol absorption has been elucidated by techniques which measure the disappearance of the sterol from the lumen of the intestine or the appearance of cholesterol in lymph, blood, or tissues. Although tentative theories concerning the mechanism of cholesterol absorption have been proposed, these *in vivo* studies have not elucidated in detail the mechanism of this process. It was therefore, decided to investigate the use of isolated inverted sacs of intestine for studies on the mechanism of cholesterol absorption in order to obtain a more direct approach to the problem.

The inverted intestinal sac technique, as developed by Wilson and Wiseman, involved the preparation of an intestinal "sausage" by injection of fluid into the serosal space of small segments of intestine which had the mucosal and serosal surfaces reversed by inversion. In this type of preparation the absorption process was followed by the passage of solutes from the incubation (mucosal or external) medium into the serosal (internal) medium.

In preliminary experiments it became evident that there was no appreciable transfer of cholesterol from the mucosal medium to the serosal medium. This appeared to be due to the absence of lymph flow in the sac preparations. However, with further experiments it became evident that the first and second steps in cholesterol absorption, namely, initial transfer from external medium into mucosal cells (uptake), and the esterification prior to transfer into lymph, could be separated experimentally and studied. This study provides the first direct experimental data on the initial transfer of cholesterol. By the development of standardized conditions which gave reproducible quantitative results, a basis has been provided for further work on the mechanism of the first step and elucidation of the esterification step in cholesterol absorption.

Since the present study was the first application of *in vitro* intestinal preparations to the study of cholesterol absorption, it was necessary to

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establish conditions for obtaining reproducible and quantitative data by the technique. Size of segments and duration of incubation for optimum cholesterol uptake were determined; these factors were then held constant throughout subsequent experiments. It was also shown that the following factors did not influence the degree of uptake: the pH of the external medium; animal fasting time prior to removal of intestine; level of the intestine from which segments were prepared; intestinal motility; and cofactors (DPN, ATP, Zn, Cu, Mn, Ni).

Other workers have found that dietary cholesterol esters do not appear in the lymph as rapidly or to the same extent as dietary free cholesterol. As an explanation for these results they proposed: first, that cholesterol cannot enter the mucosal cell in the ester form and that, therefore, esters must be hydrolyzed in the lumen before uptake into the mucosa; and second, that the hydrolysis of an administered ester in the lumen is the rate limiting factor. However, the studies presented in this dissertation clearly demonstrate that cholesterol esters can be taken up by the inverted sac without hydrolysis. Furthermore, there was little difference in the rate of uptake of free and esterified cholesterol by the sacs. An explanation for the differences in absorption rates of various cholesterol esters may be that the rate-limiting step in ester absorption occurs at some step after the esters have entered the mucosal cells.

The findings in the present study are in general agreement with those in the literature on the facilitatory effect of fatty acid, in the presence of bile acids, on cholesterol absorption. Our data demonstrate that fatty acid in the presence of varying concentrations of bile salts stimulates the transfer of cholesterol into the mucosal cells. The evidence suggests that the stimulatory effect of fatty acid in the presence of bile salt occurs at the uptake phase rather than during the esterification process. It was interesting that when fatty acid was presented to the epithelial cells in the absence of bile salt, cholesterol uptake was actually inhibited.

It has been proposed that cholesterol enters the intestinal wall as a water soluble cholesterol-bile salt complex. This proposal was based on the observation that in bile-duct cannulated rats, dietary cholesterol-4- C^{14} did not appear in the intestinal wall or lymph unless taurocholate was also included in the diet. However, the data presented in this dissertation demonstrate that cholesterol may be taken up by the mucosa in the complete absence of bile salts. Furthermore, it was shown that cholesterol uptake is not increased in the presence of pure or synthetic bile acids. From the present study it is suggested that bile salts may be necessary for the esterification of cholesterol prior to passage from the mucosal cells into lymph rather than for passage of the sterol into these cells.

It is well known that amino acid and carbohydrate absorption requires energy. It has been suggested that energy is required to overcome the concentration barriers that exist during the active absorption process.

One might expect that cholesterol transfer into the mucosa would also require energy. However, it was surprising to find that cholesterol was apparently taken up by the sac against a concentration gradient with the expenditure of little or no energy. It was demonstrated that accumulation of cholesterol in the sac could occur in the absence of glucose and oxygen which are normally required for energy production. However, since it is known that tissue lipides are protein-bound, the role of protein in the uptake process was studied. It was demonstrated that as the amount of protein in the incubation medium was increased, cholesterol uptake tended to increase. Furthermore, a cholesterol-protein complex was isolated from the sac wall. Analysis of this complex showed that it contained 50 per cent cholesterol and 50 per cent glycoprotein. In view of the high proportion of cholesterol in the protein-complex, it is suggested that this glycoprotein is the primary acceptor of cholesterol in the intestinal wall and acts as the transferring agent for cholesterol passage into mucosal cells. These data may suggest that cholesterol is probably transported into the sac via a series of protein transfers. This process involving protein binding would explain the large accumulation of cholesterol in the mucosal cells without the expenditure of energy.

In view of the fact that only 35-50 per cent of dietary cholesterol is absorbed under normal conditions, as compared to 95 per cent absorption for other lipides, carbohydrates and proteins, it is possible that natural inhibitory factors affecting cholesterol absorption are present in the body. The technique developed seemed especially suitable for consideration of the inhibitory question, since it would be expected that inhibition or stimulation of cholesterol absorption would occur at the point of transfer into the mucosal cell. With the sac technique it was, therefore, possible to consider the role of both dietary and endogenous factors which may regulate cholesterol absorption. The data presented has demonstrated the presence of an inhibitor of cholesterol absorption in bile. Isolated fractions of bile which exhibit inhibition have been shown to contain a highly water-soluble conjugated acid. Chemical analysis of these fractions showed that they were free of bile acids. In addition, assay of mucosal homogenates indicated that a comparable inhibitor was also present in the intestinal wall. The results of a series of assays of various types of bile preparations showed that the most inhibitory fraction of those tested was a commercial preparation of sodium taurocholate prepared from bile. Comparative assays utilizing purified synthetic taurocholate demonstrated that most of the inhibitory activity of the commercial preparations was not due to the presence of bile acids. It was therefore, concluded that an inhibitor of cholesterol absorption is present in bile which was not removed during the commercial preparation of the sodium taurocholate. It is suggested that this inhibitor found in bile regulates the amount of cholesterol which is absorbed by limiting the amount of sterol entering the mucosal cells.

THE *PASTORELAS* OF JOSÉ TRINIDAD REYES: A CRITICAL STUDY

By EDWARD LEWIS HOFFMAN*

The purpose of this dissertation has been to make a critical study of the *Pastorelas* of José Trinidad Reyes (1797-1855) of Honduras. Their component parts—stagecraft, scene, nature, form, characterization, satire, allusion, pastoral themes, sociological aspects, religious elements, verse, language, music, and style—were examined in detail. The study begins with an account of Reyes' life and activities which we see reflected to some extent in his work and which enable us to understand his social attitude, ideology, and allegiance. The *Pastorelas* are summarized and their parallels and affinities to, and divergence from, other pastoral writings are examined with the purpose of seeing where Padre Reyes follows or deviates from his predecessors. In this way we are able to establish some degree of relationship between the *Pastorelas* and their antecedents and analogues.

In an effort to place Reyes in his proper perspective as a poet, one should say from the start that he showed a concern for his audience. He appealed to the inherent love of the theater in people of Spanish descent, and he wrote to please them. He also showed a power to make his audience share in his emotion. With his pen he turned a commonplace happening into a striking event, but, at times, applied language that was too dignified for trivial occasions. He probably did not reach the height of bucolic minstrelsy; but one cannot accuse him of mediocrity of language or poverty of conception. It is possible that he lacked subtle qualities and displayed a limited imaginative range. However, such a statement may do less than justice to P. Reyes' positive characteristics. His verse conformed to well-defined metrical patterns and there was little forcing of syllables to fit into a mold. His poetry was an interaction of meaning and form. Interesting as are the many elements in the *Pastorelas*, Reyes' rank as an artist is dependent less on his lines of thought and philosophy than on his lyrical ability. Writing poetry that was meant to be read aloud, he was a master of melody which in variety and pure beauty was the equal of his contemporary Spanish American poets. He used his lyric gift to express elemental human feelings in a kind of verbal music. He chose his sounds in such a way as to suggest and echo the elation or the depression that he felt, or the joy or the sorrow that he sought to utter. Using a language

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with little artificial diction, he did service to Spanish American letters by his natural and spontaneous use of words. The forty-two distinct forms of verse employed in the *Pastorelas* bear witness to the poet's skill.

Reyes realized the potentialities of the pastoral genre for education, reform, and attack, and he saw in his hands a ready-made instrument that had already served earlier pastoralists well. By utilizing the pastoral, Reyes hoped to achieve several main goals—education, entertainment, and presentation in simple, but dramatic form, of the Christmas story. The results of the study show that his political thinking was constructive, and, to a far greater degree than many of the early pastoral dramatists, he used his plays to bring forth his ideas of reform.

Reyes' originality rests upon several factors. Chief among them, perhaps, is his ability in blending many elements (pastoral, humorous, satirical, religious, musical, and sociological) within a dramatic framework to achieve a pleasing synthesis. Differing from many of the earlier pastoral writers, he pays more attention to the development of his characters and to the formation of good dialogue. Although extremely basic in his stagecraft, Reyes displayed originality in the dramatic effectiveness of his situations, particularly by using peripeteia instead of the *entremés* to break the course of an action or to change scenes, and in the type of introductory action he employed in the place of the formal prologue or argument.

More democratic than many of his predecessors, Reyes addressed his thoughts to his fellow Hondurans in general and not to any one class as was so commonly done by previous pastoral writers. He attacked the regimentation of mankind and believed in the reaffirmation of the values of a moral life.

Padre Reyes' influence is evident in several important fields. As an educator, he worked for the establishment of schools, founded the University of Honduras (1847) and its library, and he was a professor in that institution. Honduras had no printing press and Reyes introduced one. He also wrote the first textbook in his country. He advocated better medical instruction and was the champion of equal educational rights for women—thus becoming Honduras' first feminist. As a statesman, he was elected delegate several times and strove constantly for peace and unity in his country. He also favored the Central American Confederation. As a priest, his sacred oratory is still remembered and his restoration of several historic old churches bears testimony to his skill as an architect. As a musician, he composed numerous Masses, cantos, and arias; wrote the songs in his *Pastorelas*; and introduced the first piano into Honduras. As an impresario he brought Spanish plays to Honduras, but his own plays—the first dramatic pieces written in Spanish in his country—were those that won the hearts of his people. If these plays marked the beginning of the Spanish-lan-

guage theater in Honduras, they were also filled with Reyes' passion for social justice and constructive thinking in social and political fields, thus establishing him as Honduras' first sociologist. The *Pastorelas*, a kind of "fotografía moral" as the Honduran critic Rómulo E. Durón termed them, had a healthful and powerful influence on life in Honduras, by showing as they did, the defects of the time in that country. In this study, of course, we have focused our attention primarily on the aesthetic aspects of the *Pastorelas*. For fifty years after the death of Padre Reyes, the *Pastorelas* had been gathering dust in manuscript form until Rómulo E. Durón recovered and published them in 1905. Oral tradition, however, as a tribute to Reyes and as a sign of the vigor of these dramatic pieces, had kept them alive, and even today they are played in many towns and villages of Honduras. In 1955, the Centenario del Padre Reyes was observed appropriately in the Republic of Honduras with plays, pageants, and discussions relative to P. Reyes being held in schools and other public places, and the publication of biographic material was carried out by the Ministry of Public Education.

ANTIGENS ASSOCIATED WITH VIRULENCE IN *PASTEURILLA PESTIS*

By WILLIAM DANIEL LAWTON*

The present study is concerned with an investigation of the antigens of *Pasteurella pestis* that might be related to the virulence of the organism. The initial work centered on the determination of as many antigens as possible so that a correlation might be made between virulence and the ability to produce specific antigens. By use of various absorbed and unabsorbed antisera in gel diffusion procedures, nineteen individual bands of precipitate corresponding to specific, individual antigens were clearly observed. The designation F, I, T, V, and W were given respectively to Fraction I, #4, toxin, V, and W. These antigens have been characterized to various degrees by previous investigators. The remaining fourteen antigens were given arbitrary letter designations.

Production of eighteen of these antigens by virulent and avirulent strains under various cultural conditions was measured. Antigens F, I, V, and W were produced by *P. pestis* when the organisms were grown in Difco heart infusion broth at 37 C but not at 26 C. Antigens D, F, and T were apparently specific to *P. pestis*, antigens M and N were produced only by *Pasteurella pseudotuberculosis*, and thirteen antigens were common to both species. Antigens V and W were associated with virulent strains, thus confirming the same finding previously made by Burrows.

Five different genera were tested for their ability to produce each of eighteen antigens observed in this study. Under the conditions employed, *Escherichia coli*, *Brucella abortus*, *Malleomyces mallei*, *Pseudomonas pseudomallei*, and *Pasteurella tularensis* all failed to produce any of the eighteen antigens detected in *P. pestis* and *P. pseudotuberculosis* cultures.

Since this study was based on the hypothesis that a demonstration that antibodies to an antigen are protective is probably the most secure basis for inferring that the antigen influences virulence, attention was directed toward those antigens likely to be associated with protection against plague. Since *P. pseudotuberculosis* was known to immunize guinea pigs against plague, the sera of guinea pigs injected with acetone killed *P. pseudotuberculosis* were examined for antibodies that might be associated with immunity. An apparent correlation was found be-

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tween L antibody and immunity to pneumonic plague. Several guinea pigs, whose sera showed only L antibody, survived respiratory challenge of 52,000 virulent plague organisms (approximately 10 times the LD₅₀ dose). Because of this, L antigen was partially purified, primarily by use of continuous flow curtain electrophoresis. The partially purified material, when injected into guinea pigs, induced the formation of L antibody, but the guinea pigs were not immune to plague. The conclusion was drawn that either L antigen was changed during purification, or, more likely, L antigen is highly antigenic but not immunogenic.

A second attempt toward defining the protective antigen(s) common to *P. pseudotuberculosis* and *P. pestis* was based on a report by Keppie *et al.* that the insoluble residue of ultrasonated avirulent cultures of *P. pestis* was immunogenic in guinea pigs. This observation was confirmed, and it was further shown that cultures of *P. pseudotuberculosis* treated in a similar manner were immunogenic in guinea pigs. Examination of the sera of guinea pigs injected with this type of vaccine showed that one major antibody was present in the sera of all the immune animals. This was identified as Q antibody, and an attempt was made to purify Q antigen. The purification of this antigen was relatively simple as it migrated toward the cathode in the continuous flow electrophoresis apparatus under conditions that caused all the other antigens to migrate toward the anode. However, when purified Q antigen was injected into guinea pigs, Q antibody formation was induced, but the animals demonstrated no immunity to plague. It appeared that Q antigen, like L, may be a highly antigenic but a non-immunogenic substance.

Additional information obtained on the protective factor common to *P. pestis* and *P. pseudotuberculosis* includes the following: (1) it can be obtained in the insoluble residue of sonates from avirulent strains of *P. pseudotuberculosis* that produce no F, V, or W antigens; (2) it can be solubilized in 0.05 M NaHCO₃ buffer, pH 8.5, dialysed against distilled water, and lyophilized; (3) its protective activity is destroyed by 1.0 per cent sodium desoxycholate; (4) after dialysis against 0.01 M Tris buffer, pH 7.5, it is not absorbed by N, N-diethylaminoethyl (DEAE) cellulose.

For many years, it was thought that Fraction I (F antigen) was essential for virulence in *P. pestis*. However, Burrows, by use of F antibody to sediment capsulated cells, was able to isolate an unencapsulated (F antigen negative) virulent strain, which he designated M23. He further showed that mice, vaccinated with purified F antigen, were immune to typical F antigen positive virulent strains, but were not immune to strain M23.

In the present study, the latter experiment was repeated using guinea

pigs instead of mice. When guinea pigs were vaccinated with 5 μ g quantities of purified F antigen, 4-8 weeks later F antibody could be detected in their sera, and they were fully immune to challenge with the virulent Alexander (F antigen positive) strain. However, when the vaccinated animals were challenged with the M23 (F antigen negative) strain, they were more susceptible to infection than the unvaccinated controls. An attempt was made to determine if antibody production in general was suppressed in animals possessing F antibody. A group of guinea pigs was vaccinated with purified F antigen mixed with Freund adjuvant and a control group with just Freund adjuvant. After 4-6 weeks, when measurable amounts of F antibody was present in the sera of the first group, all animals were injected with different vaccines, such as killed *P. pseudotuberculosis* or purified fractions from cultures of *P. pestis*. Sera obtained from both groups at 1, 2, 3, and 4 weeks after vaccination were tested in gel diffusion plates, but no obvious difference in either the type of antibody produced or the rate of antibody formation was observed between the group pre-vaccinated with F antigen and the control group.

The biosynthesis of V antigen by *P. pestis* strain M23 was studied by use of organisms grown at 26 C to suppress V antigen synthesis, and subsequently incubated at 36 C under various cultural conditions to determine the effect on the synthesis of V antigen. Some of the factors found to influence the production of this antigen were as follows: (1) at least 3 per cent Bacto Casitone and 0.02 M gluconate were essential; (2) NaHCO_3 had no effect; (3) oxygen was essential; (4) pH between the range of 6.0 and 8.0 made little difference; (5) temperature between the range of 34.9 C to 39.6 C made no difference; (6) calcium was inhibitory (at 0.004 M) for the production of V antigen by two separate batches of cells grown at 26 C, but had no effect on a third batch of cells.

The availability of W antiserum at this point in the investigation made it possible to demonstrate that W antigen was apparently produced under the same conditions that favored V antigen production. Various attempts were made to purify V and W antigens, and the procedure finally adopted was as follows. Large batches of *P. pestis* strain M23 were grown at 26 C and subsequently incubated at 36 C in modified Bacto Casitone (BC) medium. The proteins in the supernatant fluid were precipitated by 3.0 M $(\text{NH}_4)_2\text{SO}_4$, dialysed against 0.01 M Tris buffer, pH 7.5, and absorbed on a DEAE cellulose column. A linear gradient of 0-1.0 M NaCl flowing through the column at a rate of 1.0 ml a minute caused the elution of V, W, and one other antigen at approximately 0.7 M NaCl. The antigen other than V and W could be sedimented in the ultracentrifuge under conditions that permitted both V and W to remain in the supernatant fluid.

A new antigen, designated R, was shown to be produced only by virulent strains of *P. pestis*. R antigen was easily separated from V and W antigens by passing crude mixtures through DEAE cellulose previously equilibrated with 0.01 M Tris buffer, pH 7.5. R antigen was not absorbed, while V and W antigens were strongly absorbed. Partial purification of R antigen followed by absorption with an antiserum that was able to remove all antigens except R provided "purified" R antigen for the vaccination of rabbits. An antiserum was thus obtained that appeared to contain only R antibody when tested against several complex antigens in a gel diffusion plate. Preliminary testing of this serum demonstrated that R antibody passively protected mice against plague.

THE EFFECTS OF 5-BROMOURACIL ON A THYMINE REQUIRING MUTANT OF *ESCHERICHIA COLI*

By ISIDORE ARTHUR MICHAELSON*

The inhibitory nature of 5-bromouracil (5-BrU) was first demonstrated with *Lactobacillus casei*, the growth of which was limited by thymine (Hitchings, *et al.*, 1945). However, the ability for this organism to replicate was continued in the presence of the antimetabolite when folic acid was used as a nutrient. It was suggested by Hitchings, *et al.* (1950), that 5-BrU appeared to be primarily an antagonist of thymine. The nature of the competitive relationship between 5-BrU and thymine was further investigated with the utilization of 5-Br⁸⁹-U, (Weygand, *et al.*, 1951). Analysis of the extracted cell components by Weygand and coworkers (1952 a, b) of *Streptococcus faecalis* R, grown in the presence of radiolabeled 5-BrU, yielded a radioactive substance of similar chromatographic R_f as 5-BrU. It was therefore suggested that the 5-BrU, due to its steric relationship to thymine, was built into the DNA. It was later demonstrated by Dunn and Smith (1954) and by Zamenhof and Griboff (1954) that, under conditions in which *Escherichia coli* required thymine, 5-BrU was extensively incorporated into the DNA of this organism and its bacteriophage. These two teams of independent investigators recovered the analog from the DNA as the free base, nucleoside (5-bromodeoxyuridine) as well as the nucleotide (5-bromodeoxyuridylic acid), demonstrating unequivocally that the analog was built into the DNA.

The major emphasis in the early works on 5-BrU concerned incorporation into the DNA and the reversal of growth inhibition with natural nucleic acid components. However, the biochemical changes which come about as a result of 5-BrU utilization had not been thoroughly investigated. Eidinoff (1957) and Kit *et al.* (1958) demonstrated that the deoxyriboside, 5-bromodeoxyuridine, has an inhibitory effect on the utilization of thymidine-C¹⁴, formate-C¹⁴, and orotic acid-C¹⁴.

It was the purpose of the present study to investigate some of the biological and metabolic alterations which result from the utilization of the thymine analog, 5-Bromouracil. A thymine-requiring strain of *E. coli* was obtained from Dr. S. Zamenhof, who had previously reported that this organism utilized, and was inhibited by, 5-BrU (Zamenhof and Griboff, 1954). A state of continued thymine dependency was insured by the periodic streaking out of the *E. coli* on sterile petri dishes followed by the transfer of individual colonies to identical spots on thymine-containing and thymine-deficient agar-agar media. The bacterial colonies, which developed only on the thymine "replicate" area,

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were used in subsequent experiments. The bacterial growth studies were carried out in a combination of two media: (1) a basal salt medium-(A) and (2) a sulfanilamide containing medium-(S). The bacteria were first cultured in basal medium-(A), and then transferred to medium-(S) for actual experimental procedures. This method resulted in a microorganism dependent upon thymine for its growth, and by using only one cycle of (S)-medium, the selection of mutants resistant to sulfanilamide was avoided. The experimental procedure consisted of incubation in a plastic bottle containing (S)-medium, seeded with bacteria, and grown in a constant-temperature shaking box. Bacterial growth was measured by its increase in optical density (turbidity) at a wavelength of 540 m μ in a Beckman Spectrophotometer (Model DU). Periodically, 2.5 to 3 ml aliquots were transferred from the plastic bottle directly into a Beckman cuvette and the turbidity was determined.

Before measuring the growth inhibitory activity of 5-BrU, the normal requirements for growth were determined. It was found that 0.75 μ g/ml of thymine was the minimum amount of metabolite needed to maintain a near maximum rate of growth. This amount of thymine was maintained in all subsequent experiments.

The synthesis of 5-bromouracil was performed according to the method described by Weygand and Wacker (1951). Uracil in carbon tetrachloride (CCl₄), plus a solution of bromine in carbon tetrachloride (1:80 v/v), were refluxed for ten hours. Separation of 5-BrU from the reaction products was effected on a Dowex-1 anion-exchange resin (acetate form) by monitoring the effluent in a Beckman Spectrophotometer Model DU at 260 m μ . Elution was achieved by first washing the resin with distilled water followed by its gradient elution with acetic acid. The ultraviolet absorbing effluents were chromatographed on Whatman No. 1 filter paper tagged with appropriate markers. The effluents from the ion-exchange resin were identified by paper chromatography as uracil (lower R_f) while that of higher R_f had the ultraviolet absorption peak reported for 5-BrU.

An analysis of the ultraviolet absorption characteristics was made. 5-Bromouracil in 0.1 N HCl has an absorption maximum and minimum of 275 m μ and 245 m μ , respectively. In 0.1 N NaOH there is a shift to the longer wavelength with an absorption maximum and minimum of 291 m μ and 255 m μ . The molar extinction coefficients in acid and alkali are 7.1×10^3 and 4.3×10^3 , respectively.

Radioactive 2-C¹⁴-bromouracil was synthesized from 2-C¹⁴-uracil and bromine and purified in the manner described above, with R_f, ultraviolet absorption and radioactive coincidence serving as the criteria of identity.

The growth inhibiting activity of 5-bromouracil was studied by adding the analog to an exponentially growing bacterial culture. Studies on the inhibitory effect of various concentrations of 5-BrU revealed that 200

$\mu\text{g/ml}$ of culture in the presence of $0.75 \mu\text{g/ml}$ of thymine resulted in a partial inhibition of growth. This concentration of inhibitor allowed for turbidimetric increases but at a slower rate than that of the control. Within 30 minutes after the addition of 5-BrU there resulted a slowing in the rate of increase in turbidity as compared with that of the control. Microscopic examination of the inhibited culture revealed elongated cells 1.1μ in diameter and as much as 40μ in length as compared to 0.9μ in diameter and 1.1μ in length for the cells of the control culture. Within 30 minutes after the addition of the inhibitor the increase in cell number ceased abruptly while the optical density continued to increase. For both the inhibited and the control cultures there was little difference in the dry weights at the same optical density. It was therefore concluded that optical density measurements were a better index of cell mass than cell number. Therefore, under the conditions of these experiments, "growth" was defined as the ability of an organism to lay down new cellular material.

Wherever feasible radiolabeled compounds were used for studies involving analog incorporation or the utilization of precursors of known cellular constituents. Any change in the radioactive content of a particular cellular component as compared to that of the control culture could then be attributed to the influence of 5-BrU. The disposition of the radiolabeled compound among the various cellular fractions was determined by treatment with cold or hot 5 per cent trichloroacetic acid and filtration of the residues onto collodion membranes. The filtration technique was highly reproducible and enabled estimations of the incorporation of various compounds into the acid-soluble pool, nucleic acid, and protein fractions of the cell. The culture medium remaining after sampling was centrifuged and the packed cells then washed several times with basal salt medium. The cells were then subjected to extraction procedures for estimation of nucleic acid or nucleic acid components as well as for protein and amino acids components.

The actual incorporation of 5-bromouracil into the DNA was demonstrated by the electrophoretic separation of 5-bromodeoxyuridine from the other DNA nucleosides. In addition, the chromatographic resolution of the free bases from 12 *N* perchloric acid hydrolysates of DNA revealed a fifth base identical to 5-BrU. Even in the presence of thymine there was a continued uptake of radioactivity from labeled 5-BrU after the cells had stopped dividing, indicating the continued synthesis of DNA. The utilization of both $2\text{-C}^{14}\text{-uracil}$ and $4\text{-C}^{14}\text{-guanine}$ was essentially unchanged by the presence of 5-BrU, whereas the uptake of $1\text{-C}^{14}\text{-thymine}$ was completely blocked by the addition of the analog. The possibility of exchange between 5-BrU and thymine existing in DNA was excluded. Thus, the analog was utilized at the expense of the natural metabolite (thymine), for the synthesis of new DNA. The uptake of the deoxyriboside, $\text{C}^{14}\text{H}_5\text{-thymidine}$, appeared to have been unaffected by 5-BrU.

Analysis of total nucleic acid components, RNA and DNA, indicated that, while total RNA was unchanged by the presence of the analog, new DNA was depressed about 75 per cent.

The effects of 5-bromouracil on C^{14} -formate utilization for nucleic acids were investigated. The ribonucleic acid (RNA) was separated from the deoxyribonucleic acid (DNA) by application of the Schmidt and Tannhauser extraction procedure. Both RNA and DNA from these experiments were hydrolyzed with 12 N perchloric acid to their free bases and separated by paper chromatography; it was found convenient to count the radioactivity directly on the filter paper. After determining the radioactive content of the chromatographic spots the area was eluted in 0.1 N HCl and the spectrum determined for purity and total optical density. Radioactivity from C^{14} -formate appeared, as was expected, in the purines but, quite unexpectedly, it also appeared in all the pyrimidines as well. The presence of 5-BrU depressed the specific activities of all the nucleic acid bases, but it depressed the radioactivity of the pyrimidines even more than the purines. Experiments with cultures containing folic acid in addition to C^{14} -formate and 5-BrU indicated that folic acid was ineffective in relieving the depression in specific activity. Carefully controlled carbon dioxide dilution studies demonstrated that the label from formate- C^{14} , which appeared in the pyrimidine ring, most probably arose from C^{14} -O₂, an oxidation product of C^{14} -formate. There was relatively little radioactivity found in the thymine extracted from cultures grown in the presence of C^{14} -formate, confirming the opinion that the genetic lesion in *E. coli* I is probably at the level of thymine synthesis.

The chemical determination of total protein indicated a slight stimulation (4-17 per cent), in new protein synthesis in the inhibited culture as compared to that of the control. These findings encouraged a study of the effects of 5-BrU on the utilization of amino acids for new protein synthesis. Radiolabeled amino acids were employed in these studies. The cells were extracted with hot 5 per cent trichloroacetic acid and the insoluble fraction hydrolyzed for three hours at 15 ppsi in 6 N HCl. Filter membrane analysis of the fraction insoluble in hot 5 per cent trichloroacetic acid indicated that there was a stimulation in the utilization of alanine-1- C^{14} , leucine-1- C^{14} , S³⁵-methionine, S³⁵-cystine, as well as in H³-diaminopimelic acid, for new protein synthesis in the 5-BrU containing culture, as compared to that of the control. The experimental data indicated that these amino acids were stimulated 30 to 35 per cent by the presence of the analog while 3- C^{14} -serine was relatively unchanged. The various extents of stimulation in the uptake of different amino acids for the synthesis of protein, and the relatively slight increase in total protein synthesis, suggested a disruption in the normal processes of protein synthesis. Attempts made to ascertain whether these increases in amino acid utilization were a cell wall effect or a true cytoplasmic effect were unsuccessful.

STUDIES ON THE MEASUREMENT OF SERUM INSULIN-LIKE ACTIVITY USING THE ISOLATED MOUSE DIAPHRAGM TISSUE

By JIRO OYAMA*

A method has been developed to measure the insulin-like activity (ILA) of serum based upon its stimulation of glucose uptake by pooled mouse hemidiaphragms *in vitro*. Paired mouse hemidiaphragm pools were incubated either in Krebs-Ringer-bicarbonate-glucose medium (control) or in the same medium supplemented with dialyzed serum sample (test). The extra glucose utilized by the test over its corresponding control was used as the index of serum ILA which was expressed as: mg of glucose per 10 mg dry weight diaphragm tissue per 90 minutes incubation. Equivalent "serum insulin" concentrations were calculated for serum samples by comparing the measured serum ILA values with the activity of insulin standards determined under comparable conditions.

A systematic study was made of various factors employed in the mouse diaphragm method including: (1) glucose concentration of the medium; (2) pH of the medium; (3) the ionic composition of the medium including the effect of varying the potassium, magnesium, and calcium ion concentrations; (4) incubation period; and (5) diaphragm size. The most critical factors found which affected the glucose uptake were the glucose concentration and the pH of the medium. A marked dependence of glucose uptake upon the pH, decreasing with a lowering of the pH, was noted in either Krebs-Ringer-bicarbonate or phosphate buffer solutions. The change in rate of glucose utilization with the concentration of glucose in the medium was found to conform to Michaelis-Menten kinetics. The Michaelis constant (apparent) was determined to be 1×10^{-3} M glucose. The maximum rate of glucose uptake, calculated from a Lineweaver-Burk plot, was 8×10^{-6} moles (1.4 mg) per 10 mg dry weight tissue per 90 minutes incubation.

The *in vitro* effects of two hormones, epinephrine and growth hormone (bovine), were studied for their effects on the uptake of glucose by mouse diaphragm tissue. While growth hormone had no demonstrable effect on the uptake when present in concentration as high as 0.3 mg/ml, epinephrine on the contrary consistently depressed the uptake at a concentration 1,000 times less than that of the growth hormone. The addi-

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tion of epinephrine to raise the concentration of serum to about 10 times the normal physiologic level had no effect on the glucose uptake provided the serum was dialyzed in accordance with the mouse diaphragm method. The dialysis technique not only simplified the analyses of serum samples containing varying amounts of glucose but increased significantly the reliability of the glucose uptake measurements.

A study made of the recovery of crystalline insulin added to normal serum from rats and rabbits showed that there was an appreciable decrease in the ILA as measured by the mouse diaphragm method. This inhibitory activity of normal serum on ILA probably resides in the globulin fraction of serum since crystalline beef serum albumin had no inhibitory effect on the insulin response. Beef serum albumin in a final concentration of 1.6 per cent actually enhanced the response of insulin possibly by protecting it from degradation or loss by adsorption. It was concluded that the customary practice of comparing the serum ILA with the activity of insulin standards determined in an all-buffer system, devoid of serum protein, can induce significant errors in the calculation of serum insulin concentrations. In an attempt to correct for the inhibitory effect of normal serum, insulin reference standards were measured for their activity in the presence of normal serum under conditions comparable to the measurement of serum ILA. Although normal weanling rat serum showed a greater inhibitory action on added insulin than normal rabbit serum sufficient data had not been obtained to ascribe this difference to either species or individual variation in inhibitory capacity.

Insulin was found to increase the net gas production of mouse diaphragms which could be followed manometrically by a technique which has been previously applied by various workers to mammary gland slices and adipose tissue. Although a response could be consistently effected by as little as 1 milliunit and in many instances with as little as 0.1 milliunit insulin, due to variations in response, the correlation of net gas production to insulin concentrations was generally unreliable. A more serious impediment to the possible use of this technique for determining serum ILA was the effect of serum on gas retention property of the incubation medium. The presence of serum proteins so affected the measurement of net gas output that the activity of any insulin present in serum was completely masked. For this reason further studies along this line were discontinued.

The mouse diaphragm method was used to study the serum ILA in rabbits following the intravenous injection of insulin (1 unit/kg) as a function of time. The mean insulin equivalent concentration rose from an initial preinjection concentration of 70 microunits/ml to between 1,900 and 3,500 microunits/ml during a 15 to 45 minute post-injection period. Although the values for the mean serum ILA after 60 and 90 minutes were still above the preinjection level, statistically no significance

could be attached to these differences. In comparable clearance studies of intravenously injected insulin, the concomitant administration of glucose (1 gram per kg) to overcome the hypoglycemic response had no effect on the rate of insulin clearance.

Results of analyses for serum ILA of various animals showed the mean activity to increase in the order: human less than mouse, rabbit, dog, and much less than rat. The estimated mean insulin concentration ranged from a minimum of 24 microunits per ml for humans to 1,800 microunits per ml for adult rats. The mouse, rabbit, and dog mean insulin concentrations were within the 78 to 130 microunits per ml range. Rats made diabetic by alloxan treatment had a mean activity of essentially zero insulin concentration.

The significantly greater serum ILA found in normal rats led to a study in which the serum ILA of female and male Osborne-Mendel rats from weaning age of 3 weeks old up to 17 weeks of age were determined. A progressive rise in serum ILA was observed in rats between the age of 3 weeks and 6 weeks which thereafter remained essentially constant. Male rats appeared to have a slightly higher serum ILA when compared to the female rats during this interval of rapid growth. Non-fasted weanling rats had a significantly greater serum ILA than 24-hour fasted weanling rats. Young adult rats (17 weeks old) when starved for a period of 6 days showed no significant change in their serum ILA levels.

APPLICATION OF THE CONCEPT OF ELECTRONEGATIVITY TO STRUCTURE-REACTIVITY CORRELATIONS IN ORGANIC CHEMISTRY

By CALVIN DONALD RITCHIE†

The principle of the additivity of bond properties, which serves quite well for the prediction of entropies of compounds in the gas phase, does not accurately predict free energies. Both the concept of electronegativity and the linear free energy equations of Taft and of Hammett allow the quantitative prediction of deviations of the free energy of chemical reactions from that predicted by this additivity principle. Since both relationships can serve the same purpose, it appeared that they could be related.

The interpretation of the linear free energy equations in terms of the concept of electronegativity proves useful in that a smaller number of experimentally determined parameters are required by the latter concept for the prediction of equilibria and many of the necessary parameters are tabulated. Corrections to the concept of electronegativity to allow for medium effects allow the application of this principle to reactions in solution involving charged reactants. It is also shown that this interpretation of the linear free energy equations allows some conclusions regarding rates of reactions.

Starting with an equation, first proposed by Pritchard, which gives the enthalpy of a reaction in terms of the electronegativities of the component groups of the reactants and products, we are able to derive an expression for the prediction of ρ values for the Taft and Hammett correlations. It is also shown that there must be a linear relationship between Taft's s^* values and the electronegativities of groups.

For reactions which do not involve charged groups, the application of these relationships results in the prediction of ρ values from s^* values which are in good agreement with the experimental values. The final expression is similar to that which has recently been derived by Hine from quite different premises.

For reactions which involve ions, an expression is developed for the total free energy of reaction which is identical to that for reactions of uncharged components except for an additive term for the electrostatic work. This latter term is derived from the Born charging equation.

An analysis of the expression in comparison with the Taft and Hammett equations leads directly to the conclusion that s^* values are a measure of the volume over which a group can spread charge. Also, from

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the comparison we are able to derive an expression for the prediction of rho values for charged reactions. The treatment of solvent effects seems to be valid over a limited range of solvents.

From the latter expression it is possible to show that s^* values for charged groups, which have been evaluated experimentally, are not on the same scale, relative to electronegativities (and thus free energies), as the values for uncharged groups. The evaluation of s^* for charged groups, employing considerations which have been proposed by Pauling for the evaluation of electronegativities, is therefore carried out.

These calculated s^* values are then used in the expression for the prediction of rho values for charged reactions. The results obtained by the use of this equation are in good agreement with the experimentally determined values for a number of ionic reactions, considering the approximations which have been made particularly in respect to solvent effects.

The application of these expressions, in conjunction with the transition state theory, provides a method for the study of the reaction site in the transition state in terms of rates of reactions. This application is discussed in connection with the Grunwald-Winstein equation to show that simple hydrogen bonding of solvent to substrate cannot explain the effects of solvent on the rates of reactions.

Although most of the expressions which are developed in this paper lead to conclusions which have been at least qualitatively reached before, the present expressions provide quantitative results which should lead to better interpretations of data.

PYRUVATE OXIDATION BY STRAINS OF GRADED VIRULENCE OF *PASTEURELLA TULARENSIS*

By IRA WEINSTEIN*

Pathogenicity and virulence are terms often used by microbiologists and pathologists to describe the complex relationships existing between two biological systems. These terms can best be distinguished by considering the scope of each term. Pathogenicity accordingly refers to the potentiality of disease production by a given species or genus or some other grouping of parasites. All strains of a particular species need not cause disease. Virulence refers to the pathogenicity of a given stable homogeneous strain of a bacterial species, as determined by observation of its action on a particular host. Virulence is a statement of the observed behavior of individual strains under stated conditions; pathogenicity is the frequency of the appearance of virulent strains within a group.

The degree of virulence of a particular representative bacterial strain depends upon several broad factors: (1) the susceptibility of the host, (2) route of inoculation, and (3) the physiological properties of the bacterial strain. During anabolic metabolism several of the pathogenic bacteria elaborate products which are thought to enable an organism to exhibit its pathogenicity, such as toxins, or to survive and proliferate in tissues, such as capsules and various other extracellular enzymes. Aside from the effects evoked by the large complex molecules, research in the last 10 years has also shown the effects of small molecules in altering the virulence characteristics of some pathogens.

Little is known of the factors which are associated with the virulence of an organism that produces a bacteremia, such as *Pasteurella tularensis*. This organism does not elaborate an exotoxin nor do lysates of virulent strains of this gram negative bacillus mimic the disease process. Virulent and nonvirulent strains have been studied in regard to their ability to grow on complex and semisynthetic media. These were indicative of phenotypic differences but no attempt was made to correlate these biochemical differences in nutrition and enzyme content with a mechanism concerned with virulence.

For *P. tularensis* to produce tularemia, and the concomitant bacteremia, the virulent organisms must be genetically endowed with the capacity to survive and proliferate within an animal. If growth occurs, the energy yielding systems of the organism are necessarily directly concerned with

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this ability. In a review of the growth requirements of *P. tularensis* *in vitro*, it can be readily observed that the ability to oxidize pyruvate and related keto compounds is foremost in determining the enzyme economy of the cell.

The degradation of pyruvate by bacteria is mediated by a number of different enzyme systems. In brief, pyruvate can undergo carboxylation to form malate or oxaloacetate, amination to form alanine, condensation to form acyloin compounds, or oxidative decarboxylation to form acetate or acetyl-derivatives. Since oxidative decarboxylation is an important exergonic reaction, a study of this reaction might aid in correlating a biochemical characteristic with virulence. A review of the literature pertaining to the various mechanisms of pyruvate oxidation utilized by other bacteria and growth requirements of *P. tularensis* suggested to the author that pyruvate is metabolized via a sequence of reactions involving the cofactors required by *Streptococcus faecalis* and *Escherichia coli*.

The pyruvate oxidase requirements of resting cell suspensions of *P. Tularensis* were determined and compared for an avirulent strain, 38A, and a virulent strain SCHU S4. Thiamin, DL- α -lipoic acid and sodium glutamate were observed to stimulate pyruvate oxidation by the virulent SCHU S4 strain. The avirulent strain was stimulated by thiamin and DL- α -lipoic acid. Pyruvate oxidation by resting cell suspensions of SCHU S4 was stimulated by glutamate whereas under identical conditions, the avirulent 38A preparation consumed the same amount of oxygen that would be expected from the sum of the separate oxidation of both pyruvate and glutamate.

The participation of DL- α -lipoic acid was confirmed by the demonstration of inhibition in pyruvate oxidation by 20 to 50 μ moles concentrations of sodium arsenite with both strains. This concentration is indicative of DL- α -lipoic acid mediation. Phosphate was also required by both strains for maximal oxygen uptake.

Experiments were conducted to determine the kinetics of the oxidation of sodium glutamate and sodium pyruvate, alone and in combination. With both strains, the optimal substrate concentration for sodium glutamate alone was 12 μ moles, whereas maximal oxygen uptake occurred at 20 μ moles with sodium pyruvate alone. Varying concentrations of glutamate were added to Warburg flasks containing 60 μ moles of sodium pyruvate. Quantities of sodium glutamate greater than 9 μ moles did not increase oxygen uptake by SCHU S4, whereas equivalent rates of oxidation occurred at all levels of sodium glutamate tested with strain 38A. In the presence of 0.3 μ mole of sodium glutamate, oxygen uptake increased with increasing levels of sodium pyruvate up to 60 μ moles for both strains in the presence of cofactors. These experiments showed that glutamate sparks rather than decreases pyruvate oxidation by SCHU S4. The sparking effect, nonadditive stimulation, was pronounced with the

virulent SCHU S4 strain, whereas, with the avirulent 38A, the effect was nil.

Succinic, aspartic, fumaric, and α -ketoglutaric acids were able to stimulate pyruvate oxidation with the virulent strain but not with the avirulent strain. Resting cell suspensions of both strains oxidized pyruvate to CO_2 and H_2O ; sodium glutamate disappeared without the appearance of another amino acid.

A study of the metabolic pattern of strains of intermediate virulence under identical conditions is required to relate the sparking phenomenon to graded differences in virulence. Seven strains of *P. tularensis*, in order of increasing virulence for the mouse: 38A (avirulent), MAX, JAP, LVS, CHUR, 503, and SCHU S4, were chosen for this comparative study. Resting cell suspensions of the avirulent strain 38A are characterized by a low endogenous respiration, high oxidation at all levels of pyruvate employed and are not sparked by sodium glutamate. Similar preparations of the strains of graded virulence exhibited an inverse relationship of the virulence level to endogenous respiration and sensitivity to pyruvate. When pyruvate metabolism was maximum, at low levels of pyruvate, glutamate did not spark, whereas at minimum rates of oxidation, at high levels of pyruvate, glutamate sparking was observed. In strains exhibiting virulence, the oxidative rate of pyruvate metabolism was directly correlated to this characteristic.

Fluoroacetate, a known inhibitor of the tricarboxylic acid cycle (TCA) was utilized in order to determine the participation of TCA in pyruvate oxidation. Pyruvate oxidation in 3 representative strains of graded virulence, SCHU S4 (high virulence), LVS (low virulence), and 38A (no virulence), was inhibited by fluoroacetate. The degree of inhibition was correlated directly with the oxidation rate of the strain when pyruvate was the substrate.

The mode of action of glutamate in sparking pyruvate oxidation and the participation of the TCA cycle in this subsequent reaction sequence was studied utilizing cell-free extracts of the aforementioned 3 representative strains. The cell-free preparations are capable of oxidizing citrate, α -ketoglutarate, and sodium pyruvate. No cofactors were required for the oxidation of citrate. Extracts of 38A had the lowest rate, 17; SCHU S4, 30; and LVS, 36, at the optimal citrate concentration of 50 μmoles .

The oxidation of α -ketoglutarate by the 3 strains required co-carboxylase (DPT); Mg^{++} , diphosphopyridine nucleotide (DPN), and coenzyme A (CoA) were somewhat less stimulatory. Five μmoles of α -ketoglutarate were required for optimal oxygen uptake with 38A extracts whereas 40 μmoles of this substrate were required to produce optimal oxygen consumption with the LVS and SCHU S4 systems. At the concentration at which the maximal rate was observed the QO_2 (N) of

both 38A (40) and SCHU S4 (44) was higher than LVS (35). Fumaric, malic, and oxaloacetic acids are all oxidized by all of these cell-free extract preparations.

The participation of the TCA cycle in *P. tularensis* was confirmed by the demonstration of the formation of citrate from acetyl α PO_4 and oxaloacetate (OAA) in cell-free extracts of SCHU S4, LVS, and 38A. Irrespective of the concentration of acetyl α PO_4 and OAA employed, 38A extracts are able to produce approximately similar concentrations of citrate, a capacity not shared by SCHU S4 and LVS preparations.

Sodium pyruvate oxidation does not occur in any strain in the absence of DPT and glutathione (GSH) whereas DPN and CoA are less stimulatory and Mg^{++} is not required. Twenty to 40 μmoles was the optimum concentration range of sodium pyruvate for all extracts. Cell-free extracts of 38A and SCHU S4 exhibited the highest oxygen uptakes, 370 and 340 $\mu\text{L O}_2$ an hour, respectively, at 20 μmoles of sodium pyruvate. Even though the experiments are not comparable, cell free preparations of LVS were capable of oxidizing concentrations of sodium pyruvate above 40 μmoles , whereas whole cells were unable to do this in the absence of sodium glutamate.

GSH is routinely added to systems catalyzing pyruvate oxidations to maintain CoA in a reduced state. GSH has been observed to participate directly in pyruvate oxidation with *E. coli* and cysteine was able to replace GSH. Neither cysteine nor glycine could substitute for GSH in the oxidation of pyruvate by any cell-free extract in this study. Glutamate and AKG were able to replace GSH in the oxidation of pyruvate by both SCHU S4 and LVS, but not by 38A. These results are especially interesting since resting cell suspensions of SCHU S4 and LVS are sparked by glutamate and 38A is not stimulated. These results indicate other undetermined modes of action of glutamate in pyruvate oxidation.

A kinetic analysis of the oxidation of three substrates, pyruvate, AKG, and citrate as well as the substrates of the condensation reaction provide a means of a comparative analysis of enzyme-substrate relationships from one strain to another. The distinguishing feature between the strains exhibiting virulence, SCHU S4 and LVS, and the avirulent strain 38A, is the significantly low rate at which citrate is oxidized by the latter strain. With this substrate the virulent strains studied have a velocity of 2.5 X the V_{max} and a K_s 2 X that observed with 38A preparations.

These observations may explain the mechanism which allows glutamate to spark pyruvate oxidation with the virulent strains, but not with the avirulent strain. That is, irrespective of the concentration employed, pyruvate is oxidized by a series of enzymatic reactions. These are the degradation of pyruvate, the condensation of C_2 fragments with a C_4 compound, and the subsequent oxidation of citrate which results from this condensation. The 38A cells possess enzymes mediating these re-

actions which have the characteristics which account for the absence of sparking by glutamate. The lower concentrations of substrate necessary for optimal performance of these systems and the velocity of the reactions in 38A indicate the metabolism of pyruvate is moving at or near optimum without an exogenous C_4 source. The virulent strains require an exogenous C_4 source for optimal pyruvate oxidation and are stimulated by glutamate and other dicarboxylic acids.

The observations made in the foregoing study indicate that gradations do exist in energy yielding mechanisms, which vary directly with strains exhibiting virulence. It is suggested that the properties of the citric acid cycle could easily modify the expressed virulence observed in these various strains of *P. tularensis*. Virulence must be analyzed both in biochemical terms and in those factors incident to an organism which, when taken separately, may not interfere with host metabolism. Yet, when all the factors are known and considered together, an understanding may be achieved of the mechanism allowing an organism to proliferate and induce a disease process in an animal.

The first of these is the fact that the earth is not a uniform body. It is composed of various materials, some of which are more dense than others. This is evident from the fact that the earth is not a perfect sphere, but is flattened at the poles and bulged at the equator. This is due to the fact that the earth is rotating, and the centrifugal force of rotation causes the equatorial bulge. The second fact is that the earth is not a solid body. It is composed of various layers, some of which are solid and some of which are liquid. This is evident from the fact that the earth is not a perfect sphere, but is flattened at the poles and bulged at the equator. This is due to the fact that the earth is rotating, and the centrifugal force of rotation causes the equatorial bulge. The third fact is that the earth is not a uniform body. It is composed of various materials, some of which are more dense than others. This is evident from the fact that the earth is not a perfect sphere, but is flattened at the poles and bulged at the equator. This is due to the fact that the earth is rotating, and the centrifugal force of rotation causes the equatorial bulge.

SUMMARY OF DISSERTATION
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SELECTED PREPARATION AND EXPERIENCE BACKGROUND FACTORS AS RELATED TO THREE ASPECTS OF PROFESSIONAL ACTIVITIES OF ELEMENTARY SCHOOL PRINCIPALS

By WILLIAM BENJAMIN EVANS, JR.*

THE PROBLEM

Most of the studies concerned with the task of the elementary school principal seem, for the most part, to possess one major characteristic: they have permitted principals to express some opinion concerning the difficulty of the tasks with which they have to work. Very infrequently, have these studies been concerned with the factors related to the difficulty of working with selected activities or tasks. Until more is known about the factors that affect the task of the elementary school principalship, it is unlikely that data will be found that will give the profession more sound procedures for identifying, selecting, and training potential principals. In a small way, this study is a step in this direction.

This is a study of selected preparation and experience background factors as related to *three* aspects of professional activities of elementary school principals. More specifically, the study has three major purposes: (1) to determine the relationship between selected preparation and experience background factors and the *difficulty* elementary school principals experience in working with professional activities required by their position; (2) to determine the relationship between selected preparation and experience background factors and the *effectiveness* with which elementary school principals carry out professional activities required by their position; and (3) to determine the relationship between selected preparation and experience background factors and the *persistence of difficulty* elementary school principals experience in working with professional activities required by their position.

PROCEDURE

A preliminary and comprehensive review of the literature pertinent to the duties and professional activities of elementary principals and preparation experience factors that influence the performance of elementary school principals preceded the organizational phase of the study.

The sample for this study was made up of 220 elementary school prin-

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cipals from Montgomery and Prince Georges Counties, Maryland, and Arlington and Fairfax Counties, Virginia. Of the total sample 145 were women and 75 were men.

In order to accomplish the purposes of the study two types of data were needed from each principal in the sample. One type of data was concerned with information related to preparation and experience both prior to and during the principalship. These data were obtained by means of a background information questionnaire.

The other type of data needed was concerned with three aspects of professional activities of elementary school principals: (1) difficulty of working with professional activities, (2) effectiveness in working with professional activities, and (3) persistence of difficulty in working with professional activities. For securing these data, a self-rating scale was devised. The rating scale contained 104 professional activities related to five major categories: (1) supervision, (2) pupil personnel, (3) administration, (4) school-community relations, and (5) curriculum. Each principal was instructed to do three things with the rating scale: (1) rate each professional activity in terms of his difficulty in working with it, (2) rate each activity in terms of his effectiveness in handling it, and (3) rate each activity in terms of its persistence of difficulty.

The analysis of the background information questionnaires involved two steps, as follows:

1. Identifying preparation factors and experience factors.
2. Sorting of questionnaires to permit the setting up of two or more criterion groups of principals for each preparation and experience factor. The preparation factors selected for study were: (a) highest degree earned, (b) field of undergraduate study, (c) Bachelor's degree held, (d) education degree major, (e) major field of graduate study, (f) presence or absence of internship experience, and (g) in-service program planned by school system. The experience factors selected for study were: (a) years of experience in public education, (b) years of experience as an elementary principal, (c) size of school, and (d) level of professional work experience.

The analysis of data obtained from the Rating Scale involved the following steps: Data for women and men principals were treated separately.

1. Placing each specific activity into its proper category, that is, (a) supervision, (b) pupil personnel, (c) administration, (d) school-community relations, and (e) curriculum.

2. Computing mean ratings for each criterion group on each scale (difficulty, effectiveness, persistence) in relation to each of the five categories referred to in 1 above.

3. Testing the significance of the difference between mean ratings among criterion groups for each scale and for each of five categories of professional activities.

SUMMARY OF THE FINDINGS

DIFFICULTY OF WORKING WITH ACTIVITIES

Professional Preparation

1. Both men and women principals professionally prepared for elementary teaching and elementary administration had fewer difficulties in connection with supervision than those without such preparation. Men principals also had fewer difficulties in the areas of curriculum and school-community relations. Women principals had fewer difficulties in the categories of administration and pupil personnel.

2. Women principals whose professional preparation included an internship experience had fewer difficulties with administration than those who lacked such preparation.

3. Women principals who had not been provided programs of preparation planned by the educational system had less difficulty with school-community relations and curriculum than those who had been provided such preparation.

4. Women principals who had less than a Bachelor's degree had fewer difficulties with school-community relations than those with Bachelor's degrees.

Professional Experience

1. Women principals who were in charge of schools with from eleven to twenty teachers had less difficulty with pupil personnel and school-community relations than those in charge of smaller or larger schools.

2. Women principals who had thirteen or more years of service as elementary principals experienced fewer difficulties in the areas of pupil personnel and school-community relations than women principals with less experience.

3. Men principals who had more than ten years of professional experience had fewer difficulties in supervision and curriculum than men principals with less experience.

4. Men principals who were in the first year of principalship had considerably more difficulty with pupil personnel than more experienced principals.

5. Men principals in charge of schools with from eleven to twenty teachers had less difficulty with personnel than those in charge of smaller schools.

EFFECTIVENESS IN WORKING WITH ACTIVITIES

Professional Preparation

1. Women principals professionally prepared for elementary teaching and elementary administration were more effective in supervision, school-community relations, and curriculum than those without such preparation.
2. Men principals whose preparation was less than a Bachelor's degree were more effective in pupil personnel than those with more preparation.
3. Women principals who had not been provided programs of preparation planned by the educational system were more effective in school-community relations than those who had been provided such experience.

Professional Experience

1. Both men and women principals in charge of schools with more than ten teachers were more effective in pupil personnel than those in charge of smaller schools. Women principals also were more effective in school-community relations.
2. Both men and women principals who had received their professional work experience at the elementary school level were more effective in administration than those without such experience. Such women principals also were more effective in performing supervisory activities; such men principals also were more effective in performing curriculum activities.
3. Women principals who had more professional work experience than twenty-six years were less effective in administration than principals with fewer years of experience.
4. Women principals in the first year of principalship were not so effective in pupil personnel as those who had more experience.

PERSISTENCE OF DIFFICULTY IN WORKING WITH ACTIVITIES

Professional Preparation

1. Women principals professionally prepared for elementary teaching had less persistence of difficulty with supervision, curriculum, and school-community relations than those without such preparation. However, women principals who had undergraduate majors in secondary education had less persistence of difficulty with pupil personnel.
2. Women principals who had not been provided programs of preparation planned by the educational system had less persistence of difficulty with school-community relations than those who had received such preparation.

Professional Experience

1. Women principals with from two to five years of such experience had greater persistence of difficulty with school-community relations than

those in the first year or those with more than five years of experience as principals.

2. Men principals who were in the first year of principalship had greater persistence of difficulty with supervision and pupil personnel than those with more experience.

3. Women principals who had more than twenty-five years of professional experience had greater persistence of difficulty with pupil personnel than those who had more than ten years of experience but less than twenty-five.

4. Men principals who were in charge of schools with fewer than ten teachers had greater persistence of difficulty with supervision, administration, pupil personnel, and school-community relations than those in charge of larger schools.

CONCLUSIONS

This investigation seems to support the following generalizations and conclusions:

1. Principals professionally prepared for elementary teaching and for the elementary school principalship experienced fewer difficulties in working with professional activities, were more effective in handling their principalship responsibilities, and had less persistence of difficulty in working with these activities than those principals without such preparation.

2. Principals in charge of the middle-sized schools (of from eleven to twenty teachers) had fewer difficulties in working with professional activities, were more effective in handling them, and had less persistence of difficulty in carrying out their professional responsibilities than principals in smaller schools.

3. Generally speaking, the more professional work experience the principals had the less difficulty they encountered in working with activities of the principalship. This also applied to their effectiveness in handling professional activities.

4. Principals who had received their professional work experience at the elementary school level were more effective in handling their professional responsibilities than those who lacked such experience.

5. The most significant differences among criterion groups were found in the following categories, in the order listed: (a) supervision, (b) school-community relations, (c) pupil personnel, (d) curriculum, and (e) administration.

FURTHER RESEARCH

As one analyzes the findings in this study, certain needs for further research and study in the following areas seem apparent:

1. The effect of improved preparation programs as internships, vice-principalships, and programs planned by school systems. How do prin-

cipals who have had these experiences compare with principals of similar background who have not had the benefit of such experiences?

2. The relationship of preparation and experience background factors to specific activities of the principalship. Are there certain specific activities more difficult to perform than others and for which specific preparation could be provided?

3. The relationship of combinations of selected experience and preparation factors to effectiveness in carrying out professional responsibilities and tasks.

4. An analysis of the in-service education of prospective elementary school principals in order to determine which competencies may best be developed on-the-job after an individual is assigned to a principalship.

5. A study concerned with the development of criteria for determining success in elementary school administration.

SUMMARIES OF DISSERTATIONS
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A COMPARATIVE ANALYSIS OF INSURED COMMERCIAL BANKS IN WASHINGTON, D. C., AND BALTIMORE, MARYLAND, 1956

By WILBUR EARLE BENSON *

THE PROBLEM AND ITS SETTING

A modern developed economy of any significance has a large number and variety of financial institutions which facilitate exchange and the flow of capital. The commercial bank, in addition to being one of the most important financial institutions, is perhaps the oldest. The commercial bank enables other financial institutions to function and contributes directly to their activities. The commercial banking structure, either directly or indirectly, touches almost every phase of economic activity.

This dissertation is an empirical study of commercial banking in Washington and Baltimore. Its purpose is to determine the financial and operating characteristics of commercial banks in the respective cities, the extent to which they reflect their environment, and the extent to which they show diversity of administrative policy. The problem was to analyze statistics for a particular year of the financial condition and the operating performance of all insured commercial banks in Washington, D. C., and Baltimore, Maryland, by size of bank to determine major similarities and differences in banking policy and to seek causal factors. This involved: (1) determining to what extent concentration in commercial banking existed among the banks and (2) analyzing and evaluating the detailed nature and composition of the aggregate Reports of Condition and Reports of Earnings and Dividends of the banks within each city and relative to one another by size groups.

A survey of published literature and doctoral dissertations reveals that little or no attention has been directed to a comprehensive analysis of commercial banking on a city basis. Perhaps this is due, in part, to the paucity of statistics of individual commercial banks available to the public. Despite the fact that all insured commercial banks are required to publish financial summaries and banks whose stocks are distributed to the public voluntarily publish some financial and operating statistics, the information is not sufficient to make a detailed analysis. In order to make a comprehensive study one must have access to confidential data on

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file at the respective banks or data filed by the banks with the governmental agencies to whom they must report.

The Office of the Comptroller of the Currency, the Federal Reserve Board of Governors, and the Federal Deposit Insurance Corporation released aggregate data developed from confidential information contained in the Reports of Condition and the Reports of Earnings and Dividends of 25 insured commercial banks in Washington and Baltimore for the year 1956. These data were arranged in 3 size groups of deposits. The size groups, referred to as small, medium-sized, and large banks, were: \$0-\$50 million; \$50-\$100 million; and over \$100 million.

SOME ASPECTS OF THE ECONOMIC AND INSTITUTIONAL BACKGROUND

The year 1956 was a prosperous one and economic conditions were very favorable in most respects. Whether measured in terms of gross national product, industrial production, employment, or corporate profits the economy set successive records in late 1954, 1955, 1956. Increased outlays for new capital goods was the major driving force during the upswing. The swift expansion in the economy created a mounting strain upon productive facilities throughout the year. Increases in prices and wage rates that often exceeded gains in productivity aided further the inflationary forces that developed. In order to help restrain inflation the Federal Reserve Board curbed the expansion of bank credit during 1956. Nevertheless, the demand for credit continued to rise and interest rates increased sharply. The year ended with the threat of an inflationary spiral. It was the last full year of the 1954-1957 upswing; the boom having been terminated in late 1957.

The Fifth Federal Reserve District also enjoyed record prosperity during 1956. With certain exceptions, the District neither led nor lagged behind the performance of the economy as a whole. The chief contributors to the gains in income and employment were manufacturers of durable goods and specialized service industries.

The Economic Environments of Washington and Baltimore

The nature and composition of economic activity in Washington and Baltimore are vastly different. Washington is primarily a center of Government which accounts for the significantly higher proportion of total employment than in any other metropolitan area. In sharp contrast, economic activity in Baltimore is characterized by the dominance of manufacturing, shipping, and shipbuilding. Due to the significant differences in the (1) character of employment, trade, and production; (2) per capita personal income; and (3) rapid population growth of both areas, the Baltimore area is considerably more susceptible to cyclical influences.

The Nature and Types of Commercial Banks in Washington and Baltimore

The banks in the respective cities are located in the Fourth Federal Deposit Insurance Corporation District and the Fifth Federal Reserve District. Washington and Baltimore are designated as Reserve City areas. There were 17 banks in Washington operating 54 branches at year end 1956. All of the banks were insured, approximately one-half were state banks, over three-fourths were members of the Federal Reserve, and all except 2 were Reserve City banks. There were 9 banks in Baltimore operating 78 branches. All of the banks except one were insured and over one-half held state charters. Two-thirds of the banks were member banks and all were Reserve City banks except one.

CONCENTRATION AMONG COMMERCIAL BANKS

The term concentration as used in the dissertation means the extent to which a disproportionate share of the commercial banking business is performed by the banks in the 3 size groups. No attempt was made to measure monopolistic practices among the banks. Concentration was measured and evaluated in terms of total assets, loans and discounts, deposits, capital, earnings, net profits, cash dividend disbursements, and the number and remuneration of employees. Commercial banking was highly concentrated among the large banks in both Washington and Baltimore but a higher degree of concentration existed among the large banks in Baltimore than in Washington. In Washington the large banks accounted for almost two-thirds of all the commercial banking in the city. In sharp contrast, the large banks in Baltimore were responsible for well over three-fourths of all commercial banking in that city. By employing the various measurements of concentration varying degrees of concentration resulted. For example, cash dividend disbursements provided an index of maximum concentration and current operating earnings provided an index of minimum concentration. The same economic and financial reasons that are often advanced to explain the existence of concentration in some nonfinancial industries are equally applicable to the commercial banking business. In addition, it is felt that certain commercial bank regulation, while being directed toward the protection of depositors and to effect a relatively smooth and efficient monetary system, may at times impede internal growth and perpetuate and encourage external growth. In assessing the major causes that could be advanced to account for the relatively higher degree of concentration among the large banks in Baltimore it was concluded that bank merger was the most significant reason. During the past decade the rate and number of bank mergers in Baltimore has been greater than in Washington.

AN ANALYSIS OF ASSETS

The principal assets of the commercial banks in Washington and Baltimore consisted of cash, investments, and loans and discounts. The volume of assets owned by the Washington banks exceeded that of the Baltimore banks by more than one-third. Since the major types of assets were distributed in about the same proportions, the Washington banks also held larger dollar amounts of the principal types of assets.

Loans and Discounts

Loans and discounts ranked first in importance among the banks in both areas and in all size groups. An inverse relationship existed between the size of bank and the proportion of loans and discounts held. The principal types of loans and discounts in each size group and each area were commercial and industrial, real estate, and other loans to individuals. Commercial and industrial loans ranked first in importance among the large banks in Washington and Baltimore, followed in turn by loans to individuals and real estate loans. Among the smaller Washington banks loans to individuals were relatively more important than other types, whereas real estate loans ranked first among the smaller Baltimore banks. With respect to loans to individuals, the Baltimore banks invested more heavily in single payment loans than in any other type. By contrast, the Washington banks held greater volumes of installment loans to finance the purchase of private passenger automobiles. The small banks in Washington invested more heavily in loans to finance the purchase of automobiles than other banks in the city and the large banks held relatively larger proportions of single payment loans. It was found that the larger the bank in both cities the greater the importance of single payment loans and the smaller the significance of installment loans.

Conventional real estate loans secured by nonfarm residential properties predominated over all other types of real estate loans. Loans secured by residential properties insured or guaranteed by the Federal Housing Administration and Veterans Administration ranked a poor second among the Washington banks and third among the Baltimore banks. It was observed that among the Washington banks the larger the bank the smaller the relative significance of conventional loans and loans insured by the Federal Housing Administration and the greater the importance of loans guaranteed by the Veterans Administration and loans secured by non-farm non-residential properties. The small banks in Baltimore held a somewhat larger proportion of Federal Housing Administration and Veterans Administration loans than the large banks. The banks in Washington were somewhat more conservative with respect to the total volume of real estate loans held than the banks in Baltimore. Real estate loans of the Washington banks constituted smaller percent-

ages of time and savings deposits and capital and surplus than was the case for the Baltimore banks.

The volume of loans held by the Baltimore banks for purchasing or carrying securities was twice that of the Washington banks. One-fifth of such loans were granted to brokers and dealers by the Baltimore banks; whereas, among the Washington banks loans to brokers and dealers accounted for four-fifths of total security loans.

United States Government Obligations

Direct obligations of the United States Government predominated in the investment portfolios of the banks. The Washington banks held greater volumes of Government securities than the banks in Baltimore but the proportions of these securities to total assets were smaller. Among the Washington banks short-term marketable bonds and Treasury bills, certificates, and notes were the most favored obligations. It was observed that the larger the bank the larger the proportion of Government securities held. Also the large banks favored short-term bonds to a greater extent than the smaller banks. Treasury, bills, certificates, and notes were more significant among the Baltimore banks than short-term bonds. The study revealed that the larger the bank in Baltimore the smaller the proportion of Government securities held and the greater the relative importance of bills, certificates, and notes.

Cash and Cash Items

The banks in Baltimore held a smaller volume of cash than the Washington banks but the former held a larger percentage of total assets in this form. Among the Washington banks legal reserves constituted the largest proportion of cash and it was observed that the larger the banks the greater the proportion of legal reserves held. The Baltimore banks held significantly smaller percentage amounts of legal reserves than the banks in Washington and it was observed that the larger the bank the smaller the proportion of legal reserves and the larger the proportion of cash items in the process of collection. With respect to bank liquidity, the Baltimore banks, as a group and by size groups, were relatively more liquid than the banks in Washington and the United States. However, the Washington banks were more liquid than the banks in the United States.

AN ANALYSIS OF DEPOSITS AND CAPITAL

An over-all analysis of liabilities and capital revealed that depositors financed slightly more than nine-tenths of the assets of the banks. Also it was observed that the larger the bank the smaller the proportion of capital to liabilities and capital and the larger the proportion of deposits.

The Baltimore banks held smaller volumes of deposits than the Washington banks but the proportions of deposits to liabilities and capital of these banks were larger.

Deposits

Demand deposits were more significant than time and savings deposits among all banks ranging from approximately three-fourths to almost nine-tenths of total deposits. Demand deposits of individuals and businesses were by far the most predominant type of demand deposits of banks in both cities. The data revealed that the larger the bank in the respective cities the larger the proportions of demand deposits of governments and banks and the smaller the proportions of deposits of individuals and businesses. The banks in Washington held greater percentages of deposits of foreign banks and of individuals and businesses than the Baltimore banks. The Baltimore banks held significantly larger percentages of interbank deposits, Federal Government deposits, and deposits of state and municipal governments than the banks in Washington.

The volume of time and savings deposits held by the Washington banks was over twice the volume of such deposits of the Baltimore banks. Among the Washington banks personal and business deposits accounted for nine-tenths of total time and savings deposits followed in turn by deposits of the Federal Government and deposits of foreign banks. The small banks held relatively larger proportions of Federal Government deposits and smaller proportions of personal and business deposits than the larger banks. Among the Baltimore banks personal and business deposits accounted for roughly 97 per cent of time and savings deposits. The Baltimore banks did not hold any time deposits of domestic banks or banks in foreign countries and only a very small amount of time deposits of the Federal Government.

Excess Reserves

An attempt was made to evaluate the reserve status of the banks. Technically, excess reserves existed among the small and medium-sized banks in Washington and the small banks in Baltimore. However, the large banks in both cities were deficient in their reserve requirements. The large Baltimore banks had a greater dollar deficiency than the banks in Washington. Taken as a group, the Washington banks had excess reserves but the Baltimore banks did not.

Capital

The banks in Washington, in total and among size groups, held greater volumes of bank capital than the banks in Baltimore. Generally speaking, surplus ranked first in importance followed in turn by capital stock

and undivided profits. The Baltimore banks held larger proportions of surplus than the Washington banks and smaller proportions of capital stock and undivided profits. Furthermore, the data revealed that in both cities the larger the bank the larger the proportion of surplus to total capital.

An analysis of the adequacy of capital revealed that the depositors in Washington banks, in total and among size groups, were somewhat better protected than the depositors in Baltimore. Furthermore, the banks in Washington met or more closely met the minimum capital requirements of the Federal Deposit Insurance Corporation than the Baltimore banks.

AN ANALYSIS OF EARNINGS, EXPENSES, NET PROFITS AND CASH DIVIDENDS

The banks in Washington, both in total and by size groups, produced larger dollar amounts of revenue, incurred larger dollar amounts of expenses, earned larger dollar amounts of net profits, and disbursed larger dollar amounts of cash dividends than the banks in Baltimore.

The banks in Washington were more effective in producing revenue than the Baltimore banks. Interest and discount on loans and interest and dividends on securities accounted for well over three-fourths of current operating earnings. The Baltimore banks were more successful in controlling operating expenses relative to volumes of revenue and assets and thus were equally or more successful in earning profits. The principal type of current operating expense consisted of the salaries and wages of employees. In part, the reason why the banks in Baltimore were more successful in controlling expenses was the relatively smaller salary and wage payments to their employees and interest payments on time and savings deposits.

The data revealed that the larger the size group of banks in both cities the larger the percentage distributions of cash dividends relative to current operating revenue and net profits. The cash dividend policies of the Baltimore banks were in most cases more conservative than those of the banks in Washington. The dividend policies of the banks in both cities were somewhat more liberal than those of the banks in the United States.

CONCLUDING REMARKS

On the basis of the preceding analysis the major conclusions of this dissertation are: (1) commercial banking was highly concentrated in both cities but a higher degree of concentration existed in banking in Baltimore than in Washington; (2) the Washington banks performed a greater volume of commercial banking business than the banks in Baltimore; (3) the Baltimore bankers appear to have followed more conserva-

tive banking policies with respect to loans, investments, liquidity, net profits, and cash dividend disbursements than the Washington bankers; (4) in most cases the banks in Washington conformed more closely to the banks in the United States than the Baltimore banks; and (5) the majority of the commercial banking business in the respective cities is subjected to regulation that is basically uniform.

Irrespective of the criteria used, commercial banking was highly concentrated among the large banks in both Washington and Baltimore. Furthermore, a higher degree of concentration existed among the large banks in Baltimore than in Washington. The past two decades have been marked by many bank mergers which have increased concentration in commercial banking. One cause of the higher concentration in commercial banking in Baltimore was the relatively greater merger movement there than in Washington.

Banking in Washington and Baltimore was quite different in both an absolute sense and a relative sense and much, but by no means all, of the difference observed can be identified with the differences in the rate of growth of population and income, nature of production and trade, and susceptibility to cyclical influences in the respective areas. The Washington banks performed a greater volume of commercial banking business than the banks in Baltimore. For the past several decades the rate of population growth in the Washington area has been the second highest in the United States. The Baltimore area ranks sixth in this respect. The difference in the rate of population growth together with the nature of the economic structure of the Baltimore area may account for some of the difference in the level of commercial banking business in the respective cities.

Banking was also different in a relative sense and a basic cause is likely to have been differences in the type of economic activity, rate of growth, and over-all stability of the areas. It appears that the Baltimore banks were somewhat more conservative than the Washington banks. The Baltimore banks were relatively more liquid and held a much smaller percentage of their earning assets in the form of loans and discounts. Furthermore, they were better able to keep expenses at a minimum and retained a larger share of net profits than the banks in Washington. On the basis of the data, it is reasonable to infer that the Baltimore bankers employed somewhat more conservative banking policies than the Washington bankers.

The banks in Washington were, in most cases, more similar to the banks in the United States than the Baltimore banks. Because Washington is the seat of the Federal Government it is often argued that Washington differs socially and economically from any other American city. By contrast, Baltimore is similar if not typical of other manu-

facturing and seaport cities. But available statistics show that the Washington banks were in many instances more typical of the banks in the United States than the Baltimore banks.

The majority of the commercial banking business in the respective cities is subjected to regulation that is fundamentally uniform. Most of the banks in the respective cities are member Reserve City banks. Furthermore, the national banks in each city perform the majority of the banking business.

PRIOR NOTIFICATION OF CORPORATE MERGERS: AN APPRAISAL

by JOSEPH CARROLL GOLDEN *

This dissertation is concerned with the regulation of mergers in the so-called unregulated sector of the economy. The regulation of mergers is one of several means taken by government in an effort to insure the maintaining of competition. Maintaining competition has long been an aim of economic policy. While no attempt is made to prove that a competitive economy is superior to a monopolistic economy, it is assumed to be the case. A competitive economy—as distinguished from a monopolistic economy—is thought to produce certain desirable results. Among these are: a more efficient use of economic resources, a wider choice of goods and services for the consumer, freedom of entry to industries and lines of production for the producer, and a greater degree of economic growth in that competition provides a strong incentive to business efficiency. In order for an economy to be both free and private, it must be competitive.

In proceeding on the assumption that an effective level of competition should be provided and maintained, it is believed that there exists a tendency on the part of business firms to attempt to reduce or eliminate competition. Therefore, efforts must be made to counter this tendency. This is not to say, however, that competition is self-destructive, that inexorable long-run forces operate to diminish it. It is to say, however, that a laissez-faire policy is unworkable. A weakness of classical economics of the nineteenth century was its failure to recognize the necessity of government action to preserve competition.

The general objective of our body of antitrust laws is to promote and maintain competition in the economy. This it undertakes to do by rendering unlawful certain business practices calculated to lessen it. The three major pieces of legislation comprising our antitrust laws are the Sherman Act of 1890, the Federal Trade Commission Act and the Clayton Act, both passed in 1914. Since the time of their passage, a number of amendments have been made to these statutes and additional amendments proposed. The 1914 legislation reflected primarily the disappointment with the results of Sherman Act enforcement and undertook to single out specific business practices and to declare them unlawful provided they produced certain effects. These antitrust laws comprise the means by which competition is maintained.

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The regulation of mergers has been an integral part of this antimonopoly program since the passage of the Sherman Act. Dissatisfied with the ineffectiveness of subsequent efforts to regulate merger activity, Congress established a separate antimerger program in 1914 with the passage of the Clayton Act, Section 7 of which pertains to mergers. However, as a result of the failure of Congress to cause the scope of Section 7 to be broad enough to include asset acquisitions, effective regulation of merger activity was seriously impaired. Its effectiveness was impaired further as a result of a very narrow interpretation given this statute by the Supreme Court in the early cases brought by the enforcement agencies. An amendment designed to broaden the coverage to include asset acquisitions was passed by Congress on December 29, 1950. This amendment was regarded as giving enforcement agencies an effective tool with which to prevent undesirable mergers. However, the enforcement record of both the Federal Trade Commission and the Department of Justice throughout the first ten-year period following this amendment suggests inadequate enforcement. As of May 1, 1960, the Department of Justice had filed thirty-one cases and the Federal Trade Commission had filed thirty-two cases. When it is realized that each agency prepares information sheets on over 1,000 mergers annually, a combined total of only 63 complaints in almost ten years—a yearly average of slightly over six—is very few indeed. Out of this number of cases filed, over 75 per cent were pending as of May 1, 1960, and some for as long as eight years. This record of enforcement is attributed by the enforcement agencies primarily to the fact that corporations are not required to notify them of intended acquisitions or to furnish them with adequate information.

The history of merger movements shows clearly that mergers have been one of the major routes by which large firms achieved dominant positions in their markets. The statutory right of corporations to merge affords them the means by which they can effect a substantial lessening of competition and thus establish themselves in a position to exercise monopoly power over the market. While available data on mergers are far from complete, there exist sufficient data to warrant the conclusion that mergers have been a principal means by which corporations have acquired substantial market power. The growth of individual firms to great size through merger with rivals is an outstanding development of modern economic history.

Our economy has been subjected to three distinct merger movements—the early movement of 1887–1904, the second movement of the 1920's, and the third postwar movement of the 1940's and early 1950's. While the vigor of competition in a particular market depends upon a wide variety of business conditions, a substantial factor is the number and size distribution of the independent firms in the market. Mergers reduce, at least in the short-run, the number of independent firms and, thus, can

reduce competition. The placing of obstacles in the path of companies desiring to merge should not become a serious deterrent to growth or to rivalry. So long as companies are free to raise any funds they need through retained earnings or the capital market, and to spend the money for any expansion they desire, there is little to be lost by restricting merger activity. While corporations do have the right to merge, they should not be permitted to exercise this right so as substantially to lessen competition.

Section 7 of the Clayton Act requires that the enforcement agencies determine whether mergers may substantially lessen competition. While Section 7 prescribes the tests by which legality is determined, it does not prescribe the method by which this is to be accomplished. Businesses are not required to notify these agencies of their intentions to merge or to furnish them with any information. The small number of cases brought under amended Section 7 and the length of time required for their determination suggest the inadequacy of this procedure. A criterion for effective and equitable enforcement must certainly consider the adequacy of cases filed and the length of time required for their adjudication. An analysis of the record of enforcement during the 1950's reveals an unsatisfactory record. There were only a very few cases brought, long delays occurred both in the filing of the complaint subsequent to the merger consummation and in the adjudication of the case subsequent to the filing of the complaint, and great difficulties were encountered in effecting a satisfactory plan of divestiture once a merger had been held to violate Section 7. Effective enforcement requires that all mergers substantially lessening competition be prevented and that the time required for their determination be held to an absolute minimum.

This dissertation purports to analyze the basic requirements of Section 7 enforcement. The specific issues dealt with are: (1) whether it is better to prevent mergers which are likely to have undesirable anticompetitive effects rather than attempt to unscramble them after they have been consummated; (2) whether such legislation as would be necessary to achieve this objective would, if enacted, either unduly hamper legitimate business activity or constitute a departure from American jurisprudential experience; and (3) the type of legislation necessary to achieve these objectives.

Much has been written concerning merger regulation. However, virtually all of this attention has been devoted to the substantive tests to be used in deterring which mergers to exclude. While no attempt is made to detract from the importance of this aspect of merger regulation, it is believed that the failure to consider the methods by which mergers are regulated has significantly impeded effective merger enforcement. The long delay in determining competitive effects and the difficulties experi-

enced in achieving divestiture suggest a need for a new approach to merger enforcement.

INADEQUACIES OF PRESENT LEGISLATION

Our present body of antimerger law provides, in effect, that no corporation shall acquire another corporation if the effects of that acquisition may be to substantially lessen competition or tend to create a monopoly. Responsibility for the enforcement of these provisions has been given to the Department of Justice and the Federal Trade Commission concurrently. This law requires, therefore, rightly or wrongly, that these agencies determine whether a given merger will likely produce either of these two proscribed effects. To this end they must examine *all* mergers. Involved is the simple knowledge that a merger has occurred along with sufficient data by which probable competitive effects can be ascertained.

There is no provision in present law, however, which prescribes the methods by which these enforcement agencies are to learn of merger activity and collect the necessary data with which to appraise competitive effects. This seriously impairs effective enforcement. Presently, the enforcement agencies must scan the various financial newspapers for information. Often the merger has already been consummated before the agencies learn of it. And, by the time these agencies acquire sufficient data to enable them to intelligently appraise probable competitive effects many months—even years—have elapsed. Since much of this needed information is in the possession of the companies involved, a program of requiring these companies to furnish such information to the agencies at the very threshold of the acquisition would greatly facilitate the investigative work and would lead more quickly and economically to a determination of the probable threat to competition which the merger is likely to produce.

This lack of knowledge concerning merger activity and especially the inability to obtain sufficient data with which to determine probable competitive effects in time to prevent mergers get at the heart of present shortcomings in existing law. And, it explains in large measure the long delay in the filing of complaints and the long period required in the litigation of the case once a complaint has been filed.

The very nature of the merger problem is such that speedy enforcement is necessary. Effective restoration of competition becomes increasingly difficult, if not virtually impossible, when divestment is long delayed. Effective and equitable enforcement, therefore, requires that all mergers be prevented which are likely to produce the anticompetitive effects which Section 7 proscribes. This is necessary in order to give effect to the intent of Congress that such mergers be stopped in their incipency. Fairness to the business community requires that uncertainties surrounding each

merger acquisition be quickly resolved. To this end, the enforcement agencies must concentrate their energies on promptly discovering and prosecuting current Section 7 cases which threaten to impair the proper functioning of our competitive system.

Divestiture has not proved to be an effective remedy in the few cases where it has been ordered. In all of these cases, it is difficult to conclude that the same degree of competitive vigor existing in the market prior to the acquisition was restored by the divestiture. In a substantial number of cases, it clearly was not. Often, the acquiring company was permitted to retain the stock acquired, merely giving up the voting rights. In other instances, the order was thwarted due to the sheer inability to find a buyer. Too many changes occur after the acquisition which make divestiture very difficult to effectuate.

Lack of knowledge concerning merger activity and lack of adequate data with which to determine probable competitive effects prior to the merger consummation prevent the enforcement agencies from stopping undesirable mergers in their incipency. Once a merger has been consummated, the enforcement agencies are at a distinct disadvantage. The general reluctance of the courts to order divestiture, especially where the properties and personnel of the acquiring and acquired companies have become extensively commingled, encourages the defendants to attempt to cause the adjudication of the case to be delayed as much as possible.

This difficulty in obtaining data has also tended to cause the enforcement agencies to choose their cases on the basis of available data rather than upon the basis of probable competitive effects. This further encourages companies to be secretive and uncooperative.

AN ANALYSIS OF PREMERGER NOTIFICATION PROPOSALS

Serious attempts were made by Congress, during the latter part of the 1950's, to enact legislation to correct the difficulties which the enforcement agencies were experiencing in obtaining sufficient data with which to determine probable competitive effects in time to prevent those mergers likely to result in a violation of Section 7. This movement had the support of both the Department of Justice and the Federal Trade Commission. Throughout a five-year period—1956 to 1960—fifteen bills were introduced in both Houses of Congress and approximately 1,700 pages of testimony were taken in hearings concerning the advisability of such legislation. While, as of May 1, 1960, no "premerger notification" legislation had been enacted, the nature of the movement is such that such legislation in the future is entirely possible.

These bills proposed to require that all corporations, not specifically exempted, notify the appropriate agencies of their intention to consummate a merger, to furnish specified information, and wait for a period of

sixty days thereafter before completing the merger. Failure to comply with these provisions would subject the companies to a fine, ranging in amount from \$5,000 to \$50,000, recoverable in an action by the Attorney General. The purpose of the waiting period was to allow the agencies sufficient time to evaluate the data received in order that the probable effects on competition, which the merger is likely to produce, could be determined before the consummation. However, the Government was not to be penalized should it fail to proceed within this sixty-day period. At the end of this period, the companies were to be free to proceed with their merger plans. However, should the Government feel that the merger would violate Section 7, it could petition the district court for a preliminary injunction pending a determination of legality. This is the object of such legislation: to give to the enforcement agencies sufficient data with which to analyze probable competitive effects prior to the consummation of the merger in order that they may proceed to prevent the undesirable mergers rather than wait, as is presently the case, until after the merger has taken place and then attempt to obtain an order of divestiture.

Therefore, a waiting period is necessary. However, unless the enforcement agencies proceed, if at all, within this period, much of the advantage of such legislation will be lost. A second weakness is the failure adequately to provide for sanctions in the event of violations. With millions of dollars involved in the outcome of a merger, it is very doubtful that a \$50,000 possible penalty would constitute an effective deterrent.

IMPLICATIONS FOR BUSINESS

Throughout the extensive Congressional hearings held during 1956-1960 on the premerger notification proposals, it became quite clear that the business community was strongly opposed to any kind of premerger notification legislation. The various objections raised can be subsumed under the following headings: (1) such legislation is tantamount to a licensing requirement; (2) it is an infringement on business freedom; (3) it compels disclosure of confidential matters; and (4) the enforced waiting period would prevent all merger activity, thereby penalizing the lawful as well as the unlawful.

It is highly unlikely that the enforced waiting period would significantly delay a merger. The problems involved in the drawing up of the merger plan and the agreement of the terms require, normally, several months to complete. Early notice could be given to the enforcement agencies thereby allowing this sixty-day period to start to run while terms are being worked out.

Neither can such legislation be considered tantamount to a licensing requirement in that no prior approval is required. The enforcement

agencies would be able to prevent the merger only if they could convince the courts that it would be in the best interest of the public if the merger were delayed until a determination of legality could be made. However, the decision would be the courts', not the enforcement agencies'.

When it is remembered that corporations are the creatures of the state and possess only those powers given them by statute, it is difficult to conclude that the requirements contained in these proposals would infringe upon business freedom. Under present law, no corporation is permitted to acquire another corporation if the effect is likely to produce a substantial lessening of competition. There is nothing contained in these proposals which would change this.

In order to help insure that confidential material received by the enforcement agencies under the reporting requirements of the proposed bills will not be divulged, a penalty is provided for in all of the proposals. However, if the present can be used as a guide, there does not appear to be much likelihood that such disclosures will take place. The enforcement agencies presently have a "merger clearance" program whereby companies can come in and discuss a proposed merger. Much confidential information is disclosed at these meetings. However, there is no record that such information has leaked to the public. Also, other agencies, such as the Securities and Exchange Commission, receive information in confidence. With no record of disclosure in these matters, it is logical to assume that there is little likelihood that information received by these enforcement agencies will leak to the public.

The advantages to the business community stemming from such pre-merger notification appear to outweigh all possible disadvantages. Such legislation would tend to equalize the relative position of all firms interested in acquisitions. Under present law, companies which desire to operate within the law and seek the counsel of the enforcement agencies are placed at a disadvantage relative to firms that prefer to proceed in secrecy. For once such information has been brought to the attention of the agencies they can proceed against the company with greater dispatch. On the other hand, by concealing the acquisition from the enforcement agencies until as long after consummation as possible, and then delaying the furnishing of information for as long as possible, valuable time is gained by the acquiring company during which to implement many changes in the organizational structure of the acquired company.

By requiring all firms to notify the enforcement agencies of merger intentions, much of the uncertainty presently surrounding merger legality would be eradicated. Such assurance would better enable the business community to proceed with the integrating of the acquired companies.

CONCLUSIONS

The following conclusions are reached:

(1) Effective and equitable enforcement of Section 7 requires that the time permitted to elapse between the acquisition or merger and the final determination of legality be held to an absolute minimum. An analysis of the enforcement record throughout the first ten years subsequent to the 1950 amendment indicates that too much time is required for a final determination of legality.

(2) Such delay is undesirable for two reasons: first, it gives rise to uncertainties disruptive to the smooth functioning of our economy and, second, it makes divestiture more difficult to achieve in those cases ultimately determined to be in violation of Section 7.

(3) The speedy determination of such cases is influenced by the methods available to the enforcement agencies by which legality is determined. While Section 7 imposes responsibility upon the enforcement agencies for the determination of whether the effects of mergers will substantially lessen competition, it does not determine how agencies are to learn of mergers or collect data necessary to an evaluation. This is a prime cause of the long delays in present merger enforcement.

(4) Many of the present enforcement delays can be eliminated by requiring corporations to notify the enforcement agencies of their merger intentions, to furnish them with data, and to delay the consummation for a stipulated period to permit an analysis of probable competitive effects.

These changes would enable the enforcement agencies to prevent mergers shown by analysis to be substantial threats to competition, rather than depend upon the present method of divestiture. This will benefit business firms by permitting them to proceed with greater assurance and with less disruptions to business activity than is presently the situation.

Though there are difficulties, premerger notification would provide for a more effective regulation of merger activity than now exists. Premerger notification would mean closer approach to the goal of maintaining competition.

THE GEORGE WASHINGTON UNIVERSITY

1821

The Junior College

1930

Columbian College (the Senior College)

1821

The Graduate Council

1893

The School of Medicine

1825

The Law School

1865

The School of Engineering

1884

The School of Pharmacy

1906

The School of Education

1907

The School of Government

1928

The College of General Studies

1950

The Division of University Students

1930

The Division of Special Students

1944

The Division of Air Science

1951

The Summer Sessions

1916

The University Hospital

1898

